2010
Upper Michigan
Fire Weather
Annual Operating Plan

Marquette, MI
(MQT)

Updated March 17, 2010

I. INTRODUCTION

This Annual Operating Plan (AOP) will identify meteorological services to be provided by the Marquette, Michigan National Weather Service (NWS) Office. The area of responsibility encompasses all Upper Michigan. This includes areas of the Michigan Department of Natural Resources and Environment (DNRE), Isle Royale National Park in the northwest, the Ottawa National Forest across the west, the Hiawatha National Forest central and east, Pictured Rocks National Lakeshore along portions of Lake Superior, Seney National Wildlife Refuge east, and the Bureau of Indian Affairs.

This NWS is supported by the Eastern Geographic Area Coordination Center (GACC).

Services provided by the NWS fall into two categories, traditional and special services. The traditional services are provided without cost and are coordinated between the user and the NWS office personnel. Most of these products are available upon request 24 hours a day throughout the year. Examples of traditional services include…

- Fire Weather Planning Forecast (FWF)
- Fire Weather Matrix (FWM) forecast for the National Fire Danger Rating System (NFDRS)
- Spot forecast
- Wildfire Potential Statement
- Fire Weather Watches and Red Flag Warnings.

Special services provided may include teaching weather related courses or an on-site Incident Meteorologist (IMET). Please reference the Geographic Area Mobilization Guide and/or the National Mobilization Guide for details about these special services.

II. SERVICE AREA AND ORGANIZATIONAL DIRECTORY

A. List of National Weather Service (NWS) offices and points of contact

1. Marquette, Michigan (MQT) office

Fire Weather Season: Traditionally April 15 to November 1. Wildfires across our area can occur almost any time of the year; however, there are generally two peaks of increased fire danger. These time periods are in the spring prior to green-up, and in the fall curing period prior to significant snow. If unavailable, our primary backup office is Gaylord, Michigan.

Online: www.crh.noaa.gov/mqt/?n=firewx (Fire Page)
http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=mqt (Spot Page)
www.crh.noaa.gov/ndfd/graphical/sectors/mqtFireDay.php
(Graphical Forecast Fire Page)
www.weather.gov/up (Forecast Area main page)
www.weather.gov (National Weather Service Main Page)

Phone: 906-xxx-xxxx
906-xxx-xxxx
906-475-5212 public
906-475-6305 fax

Address: 112 Airpark Drive South
Negaunee, MI 49866

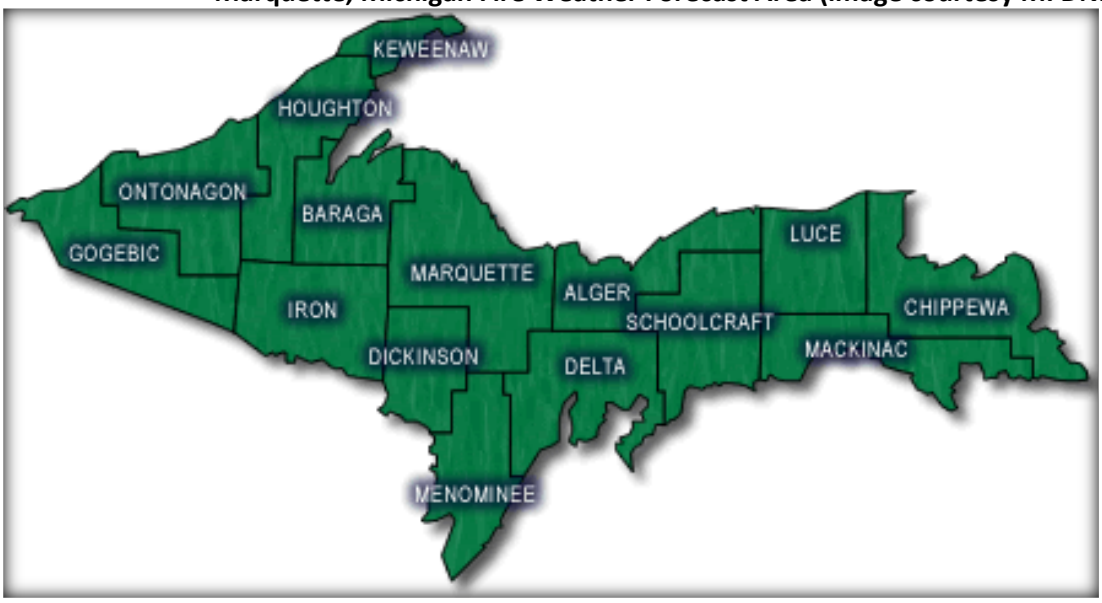
Fire Weather Program Leaders:
Jason Alumbaugh, Jason.Alumbaugh@noaa.gov
Kari Fleegel (IMET), Kari.Fleegel@noaa.gov
Additional Team Member:
Jon Voss
Meteorologist in Charge:
Robin Turner, Robin.J.Turner@noaa.gov

Watch/Warning Criteria:

- A dry spell for over a week (shorter before spring green-up or after fall color)
- Sustained Wind Speed > = 20 mph (10 m ASOS-Airport winds) or >= 15 mph (20 ft RAWS winds)
- Relative Humidity 25% or less
- Temperature 70 F or greater

Note: Temperature criteria is a soft criteria. Red Flag Warnings can be used for temperatures less than 70 degrees depending on other factors.

Marquette, Michigan Fire Weather Forecast Area (image courtesy MI DNRE)



Upper Michigan Zone Codes

Alger	MIZ006
Iron	MIZ010
Chippewa	MIZ008
Baraga	MIZ005
Delta	MIZ013
Dickinson	MIZ011
Gogebic	MIZ009
N. Houghton	MIZ003
S. Houghton	MIZ084

Keweenaw	MIZ001
Luce	MIZ007
Mackinac	MIZ008
Marquette	MIZ005
Menominee	MIZ012
Ontonagon	MIZ002
N. Schoolcraft	MIZ085
S. Schoolcraft	MIZ014

2. Surrounding National Weather Service offices

a) Duluth, Minnesota (DLH) office

Online: www.crh.noaa.gov/dlh/?n=firewx (Fire Page)
www.weather.gov/dlh (Forecast Area main page)
Phone: 218-xxx-xxxx
218-xxx-xxxx
218-729-6697 public
218-729-0690 fax
Address: 5027 Miller Truck Highway
Duluth, MN 55811-1442
Fire Weather Program Leader:
Amanda Graning, Amanda.Graning@noaa.gov
Meteorologist in Charge:
Michael Stewart, Michael.Stewart@noaa.gov
Watch/Warning Criteria:

Relative Humidity < = 25%
Wind Speed > = 20 mph
Temperature > = 75 degrees F

b) Green Bay, Wisconsin (GRB) office

Online: www.crh.noaa.gov/grb/?n=firewx (Fire Page)
www.weather.gov/grb (Forecast Area Main Page)
Phone: 920-xxx-xxxx
920-xxx-xxxx
920-494-2363 public
920-494-5823 fax
Address: 2485 South Point Road
Green Bay, WI 54313-5522
Fire Weather Program Leader:
Tim Kieckbusch, Tim.Kieckbusch@noaa.gov
Meteorologist in Charge:
Gary Austin, Gary.Austin@noaa.gov
Watch/Warning Criteria:
Relative Humidity < = 25%
Wind Speed (20 ft, 10 min avg.)> = 15mph
~17 mph, 10m airport wind
Temperature > = 75 degrees F

c) Gaylord, Michigan (APX) office

Online: www.crh.noaa.gov/apx/fire.php (Fire Page)
www.weather.gov/apx (Forecast Area Main Page)
Phone: 989-xxx-xxxx
989-xxx-xxxx
989-731-3384 public
989-731-0682 fax
Address: 8800 Passenheim Road
Gaylord, MI 49735-9454
Fire Weather Program Leader:
Jeffrey Lutz, Jeffrey.Lutz@noaa.gov
Assistant Fire Weather Program Leader:
David Lawrence, David.Lawrence@noaa.gov
Meteorologist in Charge:
Bruce Smith, Bruce.Smith@noaa.gov
Service Area: Huron-Manistee National Forest along and north of M-55
Sleeping Bear Dunes National Lakeshore
State Forest land north of M-55
Watch/Warning Criteria:

Relative Humidity < = 25%
Sustained Wind Speed > = 20 mph (10 m ASOS winds) or
>= 15 mph (20 ft RAWS winds)
*frequent gusts above wind criteria may be used in place of sustained winds.
Temperature > = 75 degrees F

d) Grand Rapids (GRR), Detroit (DTX), and Northern Indiana (IWX) offices

Grand Rapids www.crh.noaa.gov/grr/fire (Fire Page)
Phone: 616-xxx-xxxx
616-xxx-xxxx
606-949-1708 fax
Fire Weather Program Leader:
Nathan Jeruzal, Nathan.Jeruzal@noaa.gov
Assistant Fire Weather Program Leader:
Brian Meade, Brian.Meade@noaa.gov
Meteorologist in Charge:
Daniel Cobb, Daniel.Cobb@noaa.gov
Watch/Warning Criteria:
Relative Humidity < = 25%
Sustained Wind Speed > = 20 mph (10 m ASOS winds) or >= 15 mph (20 ft RAWS winds)
*frequent gusts above wind criteria may be used in place of sustained winds.
Temperature > = 75 degrees F

Detroit (DTX) www.crh.noaa.gov/dtx/?n=firewx (Fire Page)
Phone: 248-xxx-xxxx
248-xxx-xxxx
248-620-9804 public
248-625-4834 fax
Fire Weather Program Leader:
Heather Orow, Heather.Orow@noaa.gov
Assistant Fire Weather Program Leader:
Karen Clark, Karen.Kahl@noaa.gov
Meteorologist in Charge:
Richard Wagenmaker, Richard.Wagenmaker@noaa.gov
Watch/Warning Criteria:
Relative Humidity < = 25%
Sustained Wind Speed > = 20 mph (10 m ASOS winds) or >= 15 mph (20 ft RAWS winds)
Temperature > = 75 degrees F

Northern Indiana (IWX) www.crh.noaa.gov/iwx/?n=firewx (Fire Page)

Phone: 574-xxx-xxxx
574-834-1104 public
574-834-3492 fax
Fire Weather Program Leader:
Lonnie Fisher, Lonnie.Fisher@noaa.gov
Meteorologist in Charge:
Michael Sabones, Michael.Sabones@noaa.gov
Watch/Warning Criteria:
Relative Humidity < = 25%
Sustained Wind Speed > = 20 mph (10 m ASOS winds) or >= 15 mph (20 ft RAWS winds)
Temperature > = 75 degrees F

3. Other important NWS contacts

a) National Fire Weather Program Leader

Online: http://fire.boi.noaa.gov
Heath Hockenberry 208-xxx-xxxx
Heath.Hockenberry@noaa.gov
Address: National Weather Service
3833 South Development Avenue
Boise, ID 83705

b) National Fire Weather Operations Coordinator

Online: http://fire.boi.noaa.gov
Larry Van Bussum 208-xxx-xxxx, or xxxx
208-334-1660 fax
Larry.Vanbussum@noaa.gov
Address: National Weather Service
3833 South Development Avenue
Boise, ID 83705

c) Regional Operational Services Meteorologist (ROSM)

Online: www.crh.noaa.gov
Jennifer Zeltwanger 816-xxx-xxxx
816-891-7810 fax
Jennifer.Zeltwanger@noaa.gov
Address: National Weather Service,
Central Region Headquarters
7220 NW 101st Terrace
Kansas City, MO 64153

B. Participating agencies

1. Contacts and phone numbers

a) Geographic Area Coordination Center

Online: http://gacc.nifc.noaa.gov/eacc

Stephen Marien - Fire Weather Program Manager
612-xxx-xxxx
Stephen_Marien@nps.gov
612-713-7300 public
612-713-7317 fax

Address: Eastern Area Coordination Center
BHW Federal Building
1 Federal Drive, P.O. Box 29
Fort Snelling, MN 55111-4080

b) Hiawatha National Forest, USFS

Online: www.fs.fed.us.r9/forests/hiawatha/

Steve Nurse – Fire Management Officer
906-xxx-xxxx
989-xxx-xxxx cell
snurse@fs.fed.us

Jim Flores – UPC Coordinator
906-xxx-xxxx
906-xxx-xxxx cell
jflores@fs.fed.us

Linda Peterson – Dispatcher
906-xxx-xxxx
906-xxx-xxxx cell
lpeterson@fs.fed.us
906-786-4062 public
906-789-3330 fax

Address: 2727 N. Lincoln Road
Escanaba, MI 49829

c) Isle Royale National Park, NPS

Online: www.nps.gov/isro

Marshall Plumer – Acting Chief Ranger
906-xxx-xxxx
Marshall_Plumer@nps.gov
906-xxx-xxxx Visitor Center
906-482-8753 fax
906-482-0984 public

Address: 800 East Lakeshore Drive
Houghton, MI 49931-1896

d) Michigan Department of Natural Resources and Environment (DNRE)

Online:	www.michigan.gov/dnr
Acting Duty Officer	906-xxx-xxxx 906-249-1497 public 906-249-3080 fax
Allan Keto – Resource Protection	ketoa@michigan.gov
Robert Ziel – Fire Management/FBAN	zielr@michigan.gov
Celeste Chingwa – Fire Management	chingwac@michigan.gov
Debbie Wester – Dispatcher/Secretary	westerd@michigan.gov
Address:	110 Ford Road Marquette, MI 49855

e) Pictured Rocks National Lakeshore, NPS

Online:	www.nps.gov/piro
Steve Nurse – Fire Management Officer	906-xxx-xxxx 989-xxx-xxxx cell 906-789-3330 fax snurse@fs.fed.us
Matt Davis – Primary Contact	906-xxx-xxxx matthew_davis@nps.gov
Bruce Leutusher – Vegetation/Fuels	906-xxx-xxxx
Tim Colyer – Chief Ranger	906-xxx-xxxx ext. xxx 906-xxx-xxxx cell tim_colyer@nps.gov 906-387-2607 public/headquarters 906-387-3700 public/Interagency VC (Visitor Center) 906-387-4025 fax
Address:	N8391 Sand Point Road P.O. Box 40 Munising, MI 49862-0040

f) Ottawa National Forest, USFS

Online:	www.fs.fed.us/r9/ottawa
Roger Medley - Dispatcher	906-xxx-xxxx rdmedley@fs.fed.us
Acting Duty Officer	906-xxx-xxxx pager
Dean Karlovich – Fire Management Officer	906-xxx-xxxx ext. xx 906-xxx-xxxx cell 715-xxx-xxxx home dkarlovich@fs.fed.us
Robert Garrison – Assistant Fire Management Officer	906-xxx-xxxx ext. xx 906-xxx-xxxx cell

	906-xxx-xxxx home
	rlgarrison@fs.fed.us
Susan Spear – Forest Supervisor	906-xxx-xxxx ext. xxx
	sspear@fs.fed.us
	906-932-1330 public
	906-358-4829 fax
Address:	E24036 Old US 2 East
	Watersmeet, MI 49969

g) Seney National Wildlife Refuge, USFW

Online:	www.fws.gov/midwest/seney/
Gary Lindsay – Fire Management Officer	906-xxx-xxxx ext. xx
	906-xxx-xxxx cell
	906-xxx-xxxx home
	gary_lindsay@fws.gov
Michael Tuffelmire – Refuge Senior Firefighter	906-xxx-xxxx ext. xx
	906-xxx-xxxx cell
	906-xxx-xxxx home
	michael_tuffelmire@fws.gov
Greg McClellan – Deputy Refuge Manager	906-xxx-xxxx ext. xx
	906-xxx-xxxx cell
	906-xxx-xxxx home
	greg_mcclellan@fws.gov
Mark Vaniman – Refuge Manager	906-xxx-xxxx ext. xx
	906-xxx-xxxx cell
	906-xxx-xxxx home
	906-586-9851 public
	906-586-3800 fax
Steve Nurse – Zone Fire Management Officer	906-xxx-xxxx
	989-xxx-xxxx cell
	906-789-3330 fax
	snurse@fs.fed.us
Address:	1674 Refuge Entrance Road
	Seney, MI 49883

h) US Bureau of Indian Affairs (BIA)

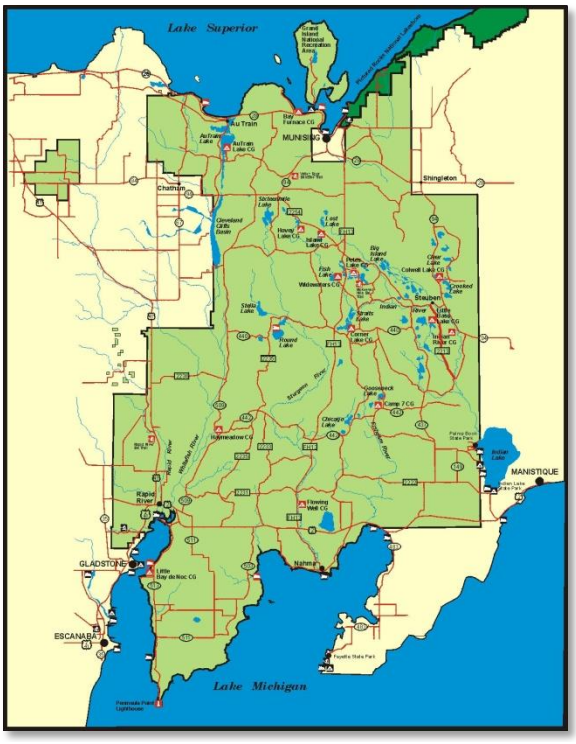
Will Wiggins – Fire Management Fuels Specialist	906-xxx-xxxx
	906-xxx-xxxx cell
	wwiggins@up.net
	906-353-7299 fax
Address:	100 Hemlock Street
	Baraga, MI 49908

2. Agency area maps

a) Hiawatha National Forest, USFS

Images courtesy Hiawatha National Forest (http://www.fs.fed.us/r9/forests/hiawatha/)

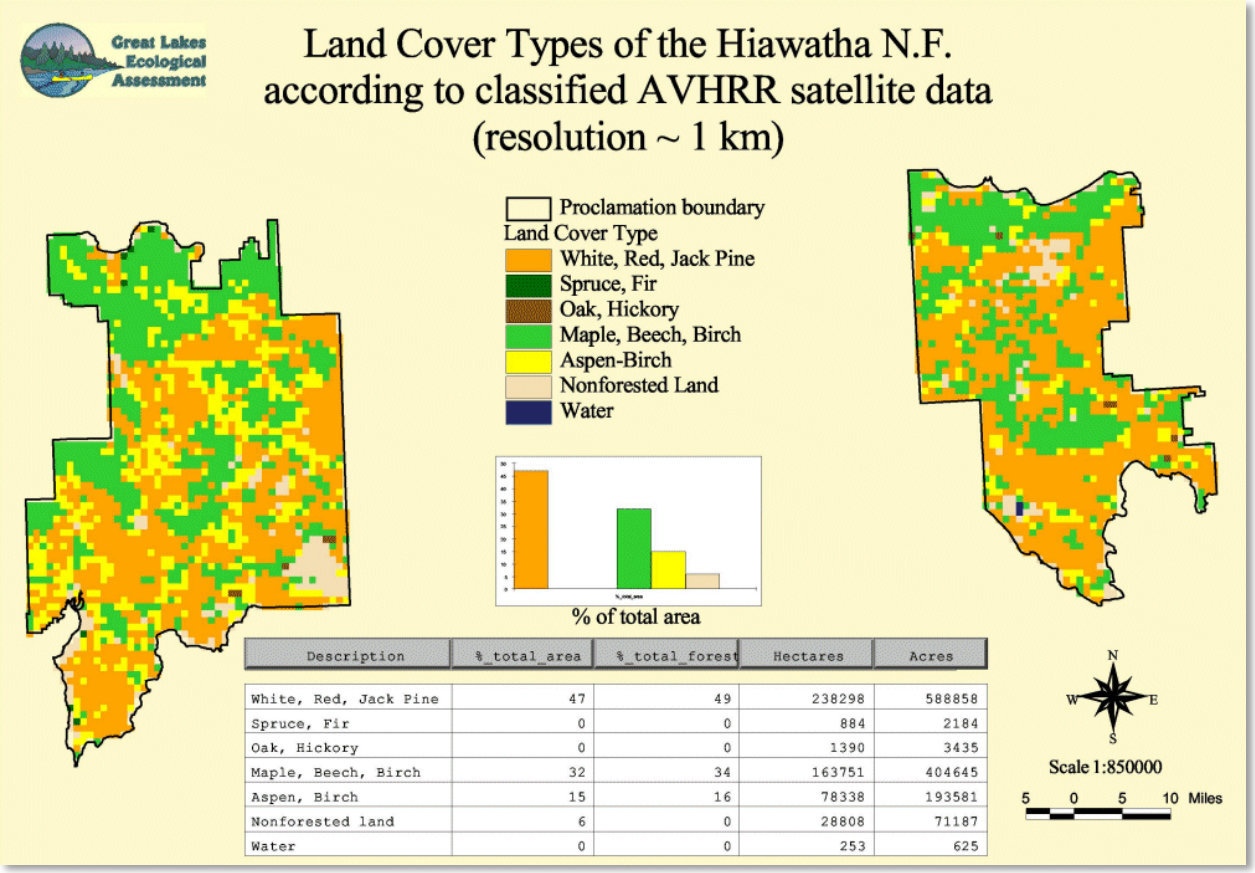
West Forest Area



East Forest Area

Land Cover Types image courtesy Great Lakes Ecological Assessment (http://www.ncrs.fs.fed.us/gla/existveg/images/hiaw_avhrr.gif)

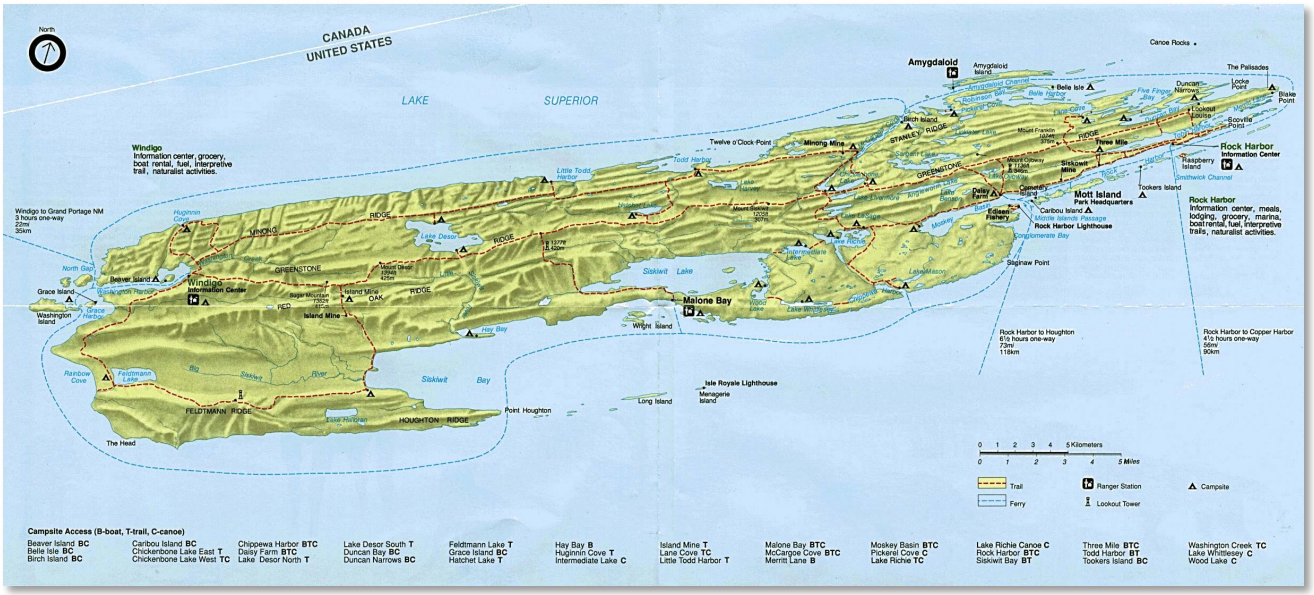
Higher resolution (~30m) TM Satellite Data also available from the Great Lakes Ecological Assessment (http://www.ncfs.fs.fed.us/gla)



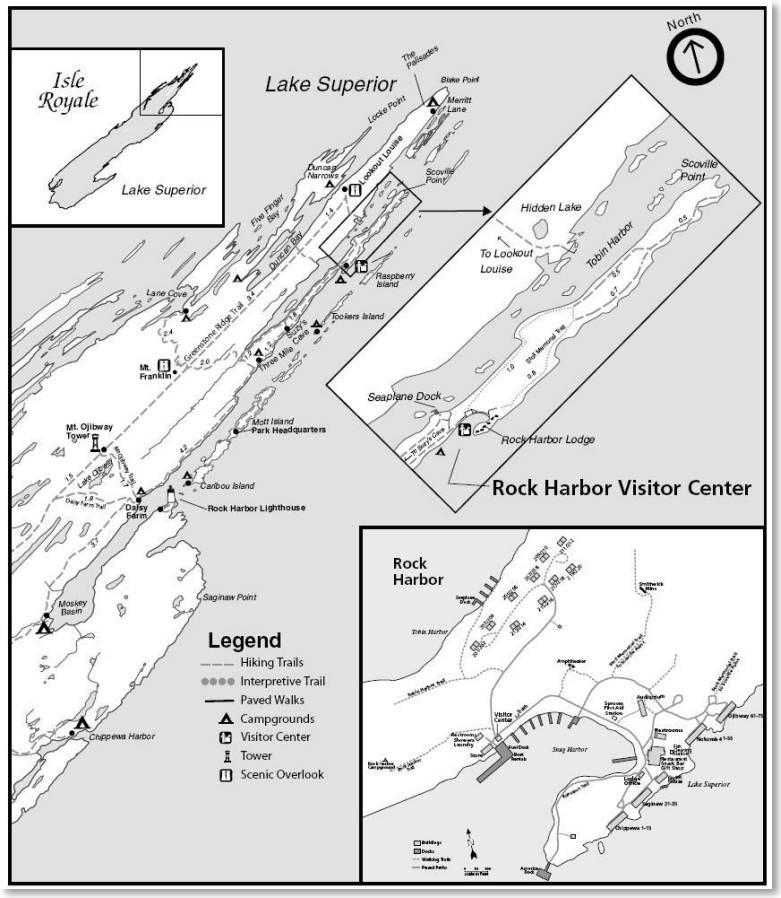
Description	%_total_area	%_total_forest	Hectares	Acres
White, Red, Jack Pine	47	49	238298	588858
Spruce, Fir	0	0	884	2184
Oak, Hickory	0	0	1390	3435
Maple, Beech, Birch	32	34	163751	404645
Aspen, Birch	15	16	78338	193581
Nonforested land	6	0	28808	71187
Water	0	0	253	625

b) Isle Royale National Park, NPS

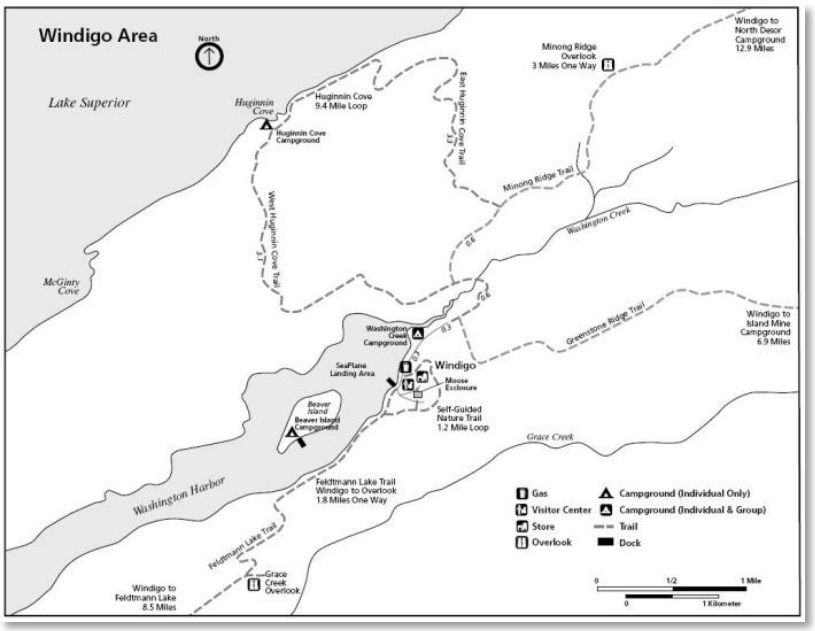
Images courtesy Isle Royale National Park (http://www.nps.gov/isro/index.htm)



Rock Harbor Area

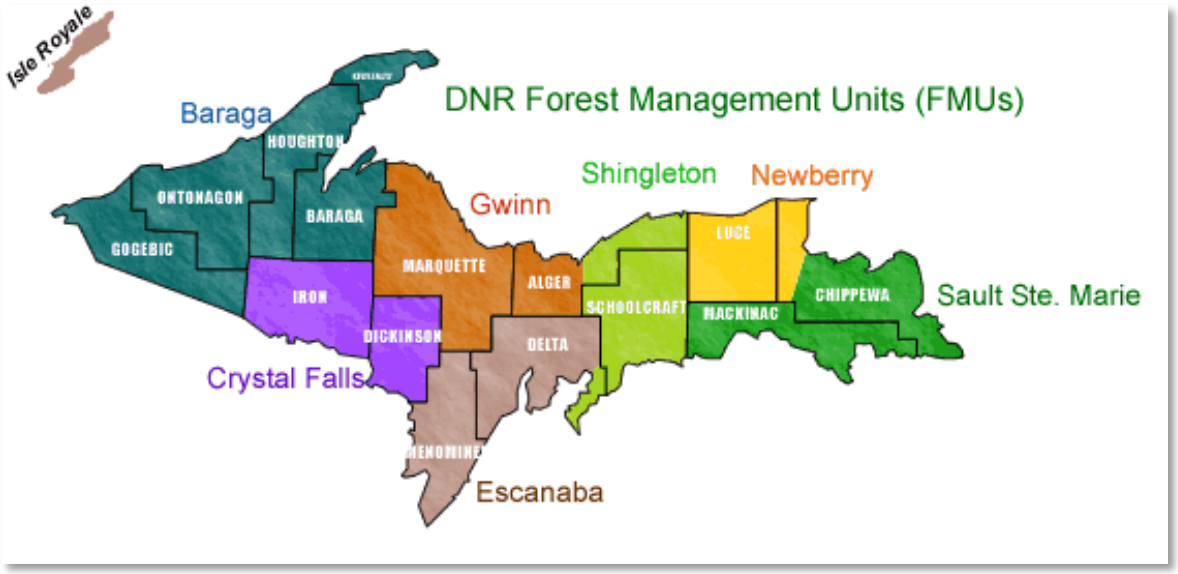


Windigo Area

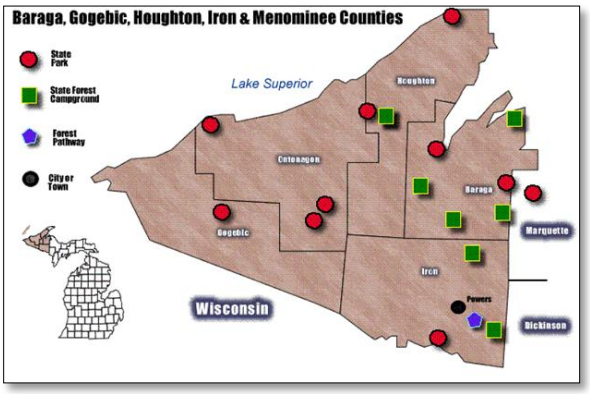


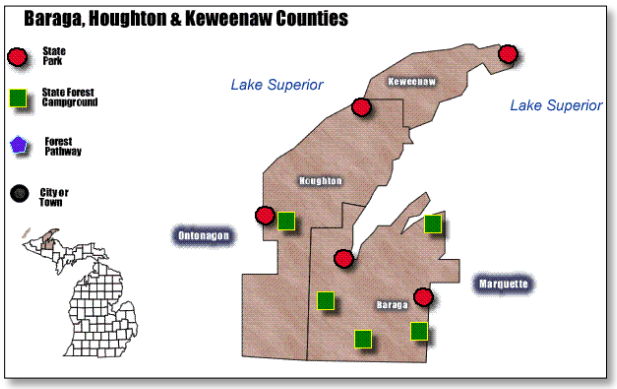
c) Michigan Department of Natural Resources and Environment (DNRE)

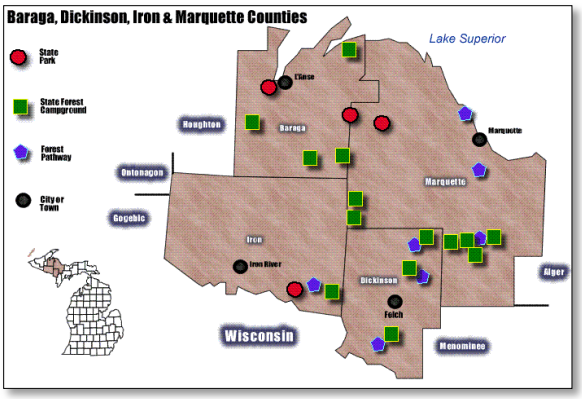
Images courtesy Michigan Department of Natural Resources and Environment (http://www.michigan.gov/dnr)

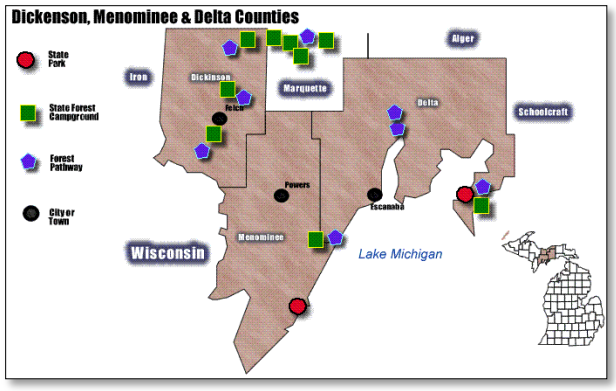


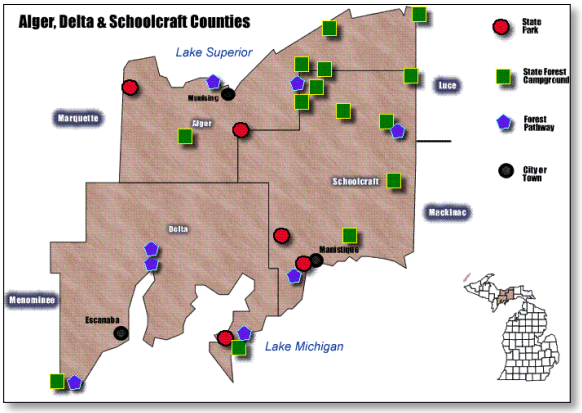
State Park, Forest Campground, and Pathways (by region)
http://www.michigandnr.com/parksandtrails/parkmap.aspx
http://www.michigandnr.com/parksandtrails/listing.aspx?list=parks

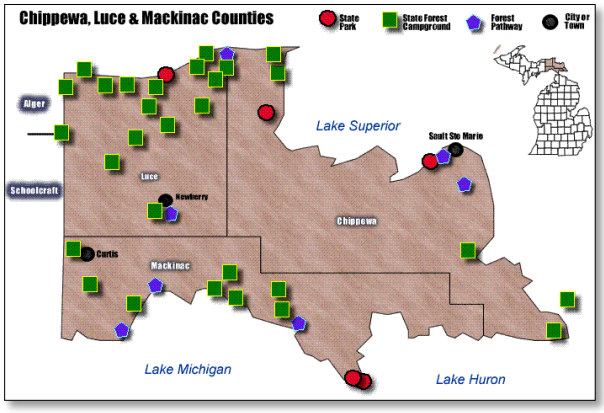





Baraga, Dickinson, Iron & Marquette Counties
Lake Superior
State Park
State Forest Campground
Forest Pathway
City or Town
Houghton
Baraga
Ontonagon
Gogebic
Iron
Iron River
Marquette
Dickinson
Felch
Alger
Menominee
Wisconsin


Dickenson, Menominee & Delta Counties
State Park
State Forest Campground
Forest Pathway
City or Town
Alger
Iron
Dickinson
Marquette
Delta
Schoolcraft
Powers
Escanaba
Menominee
Wisconsin
Lake Michigan

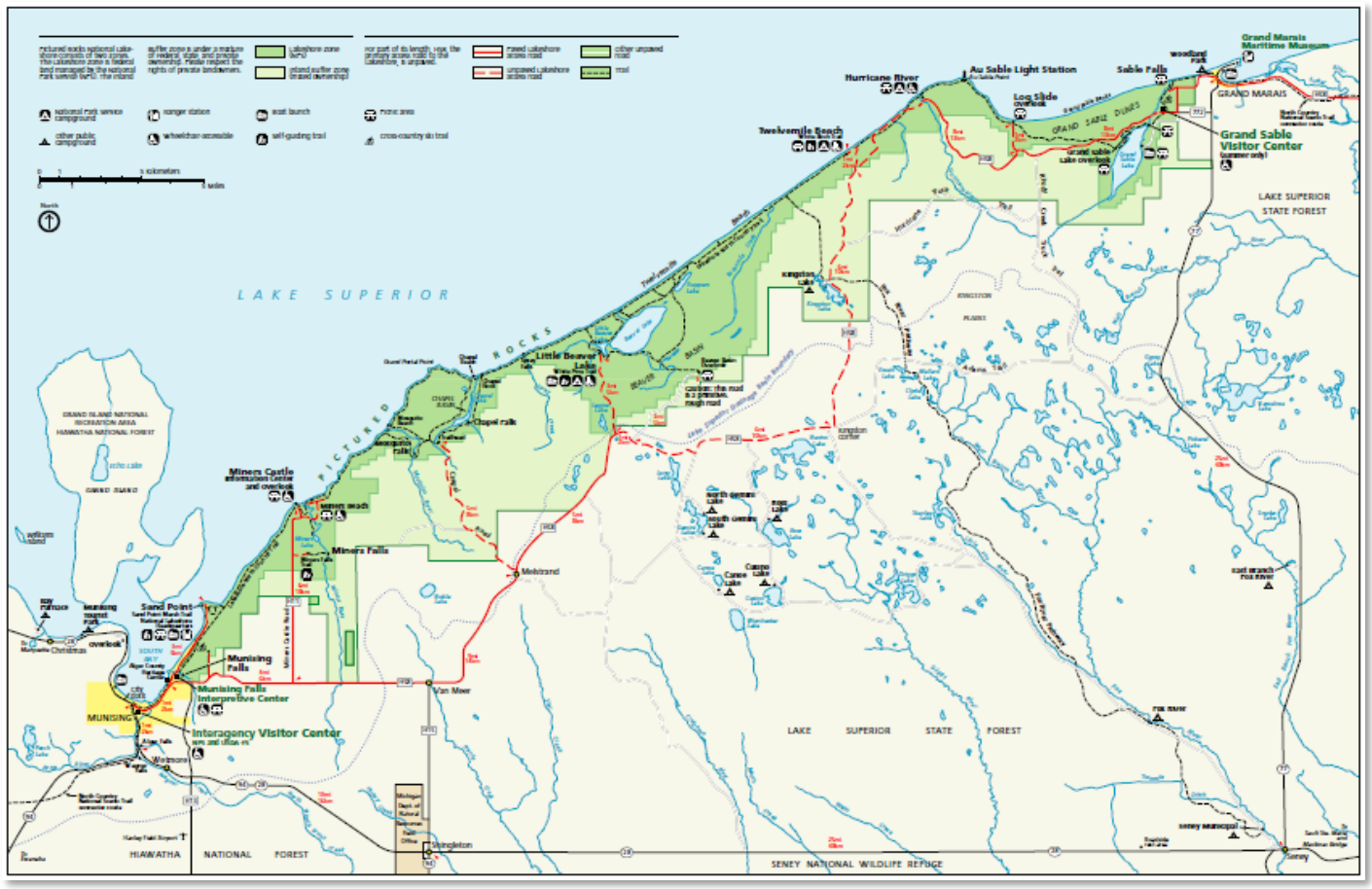

Alger, Delta & Schoolcraft Counties
Lake Superior
State Park
State Forest Campground
Forest Pathway
City or Town
Marquette
Munising
Alger
Luce
Schoolcraft
Mackinac
Delta
Manistique
Menominee
Escanaba
Lake Michigan


Chippewa, Luce & Mackinac Counties
State Park
State Forest Campground
Forest Pathway
City or Town
Alger
Schoolcraft
Lake Superior
Sault Ste Marie
Luce
Newberry
Chippewa
Curtis
Mackinac
Lake Michigan
Lake Huron

d) Pictured Rocks National Lakeshore, NPS

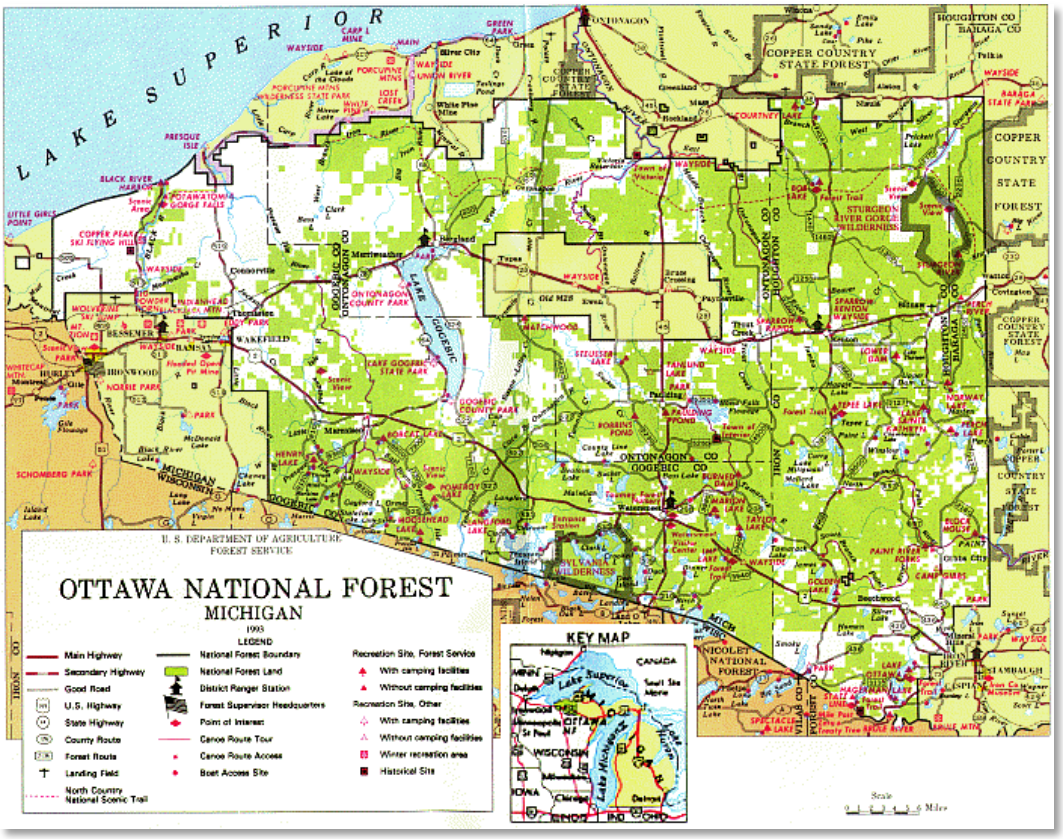
Images courtesy Pictured Rocks National Lakeshore (http://www.nps.gov/piro)

Official Park Map and Guide
http://www.nps.gov/piro/planyourvisit/brochures.htm



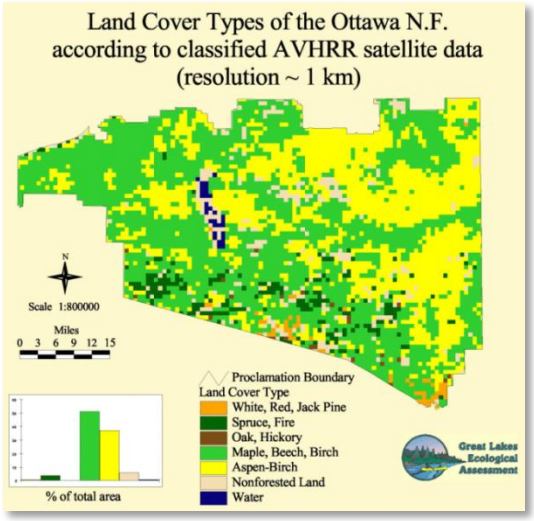
e) Ottawa National Forest, USFS

Image courtesy Ottawa National Forest (http://www.fs.fed.us/r9/ottawa/)



Land Cover Types image courtesy Great Lakes Ecological Assessment (http://www.ncrs.fs.fed.us/gla/existveg/images/ott_avhrr.gif)

Higher resolution (~30m) TM Satellite Data also available from the Great Lakes Ecological Assessment (http://www.ncfs.fs.fed.us/gla)

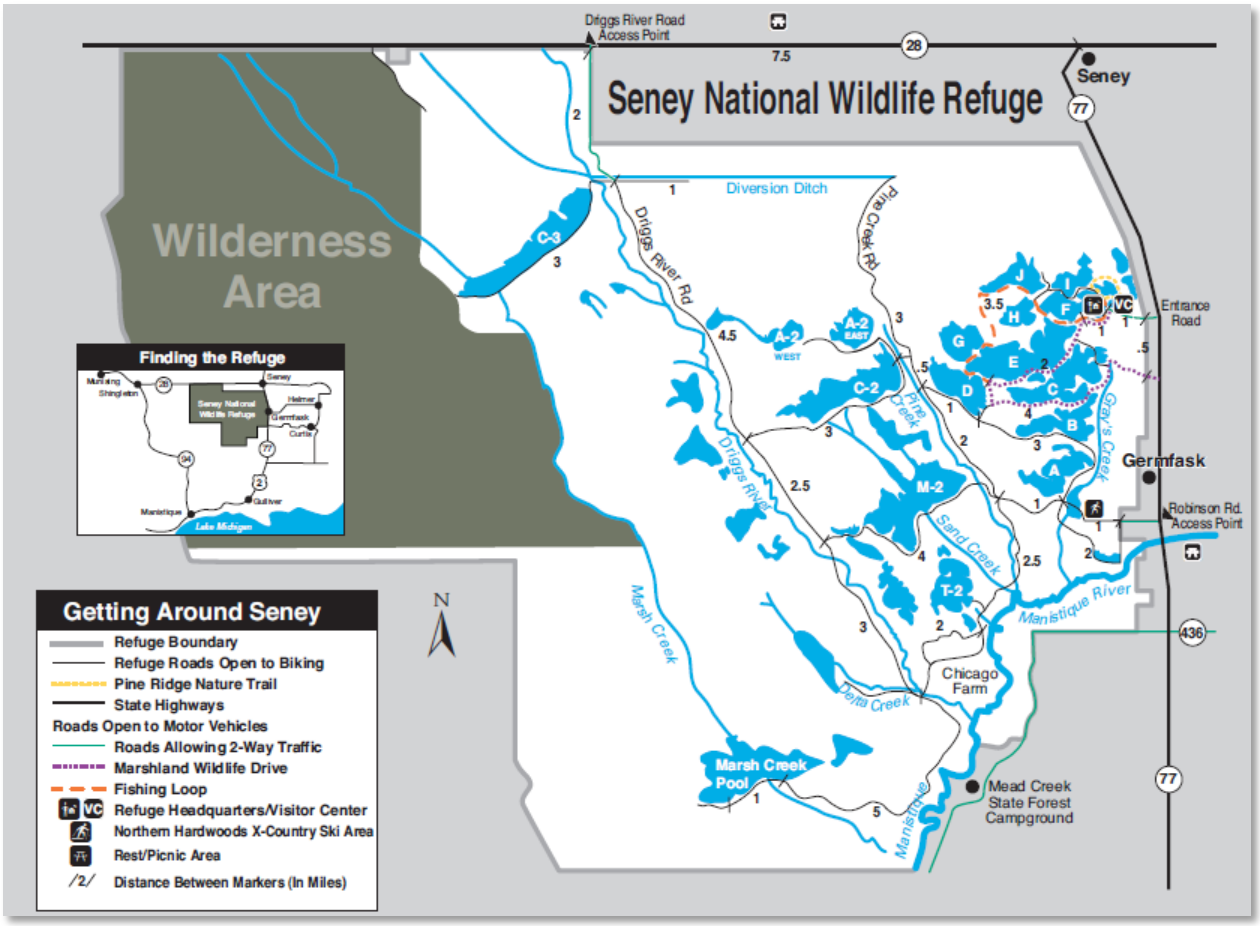


f) Seney National Wildlife Refuge, USFW

Seney National Wildlife Refuge also manages the following areas in the Marquette NWS forecast area …

- ***Harbor Island National Wildlife Refuge*** – 695 acres one mile north of Drummond Island
- ***West Huron Island lighthouse*** – 3 miles off the southern shore of Lake Superior, 18 miles east of the Keweenaw Peninsula
- ***Whitefish Point*** (migratory bird reserve) – 33 acres adjacent to the Great Lakes Shipwreck Historical Museum

Image courtesy Seney National Wildlife Refuge (http://www.fws.gov/midwest/Seney/index.htm)



III. SERVICES PROVIDED BY THE NATIONAL WEATHER SERVICE

A. Fire weather products

1. Fire Weather Planning Forecast (ARBFWFMQT)

a) Issuance (seasonal, daily)

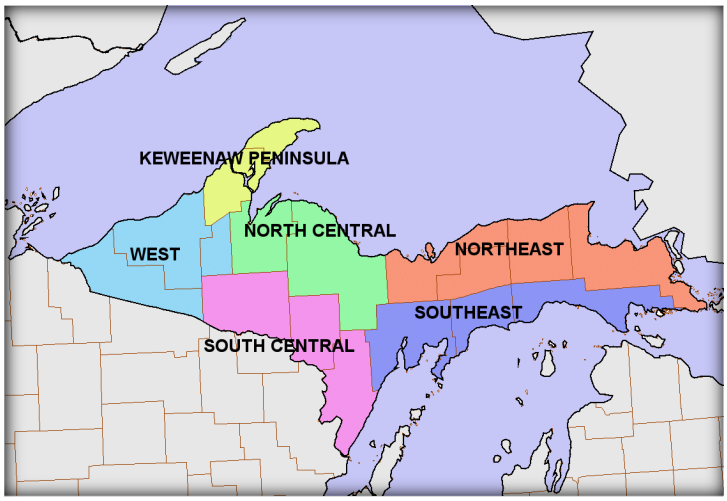
The National Weather Service in Marquette will produce the fire weather planning forecast during the fire season, which traditionally runs from April 15 to November 1. The start and end times are a collaborated between the National Weather Service and participating land management agencies. The forecast is then produced daily during the fire season, and is typically issued by 6 am local time. It will be updated during the day if significant differences are expected or occurring.

b) Posting

The primary way to receive our forecasts would be through our website, www.weather.gov/up and more specifically the Fire Weather link in the left column (www.crh.noaa.gov/mqt/?n=firewx). Forecasts are also available through WIMS, GACC Predicted Services as well as other linked sites.

c) Content

This product usually has a set county/zone combination. The forecast will include the next 3 weather periods in detail: today, tonight, and tomorrow. The following forecast example, for western Upper Michigan, is only a fraction of the entire forecast.



Traditional County/Zone Combination:
West = Gogebic, Ontonagon, Southern Houghton
Keweenaw Peninsula = Keweenaw and Northern Houghton
North Central = Baraga and Marquette

South Central = Iron, Dickinson, and Menominee
Northeast = Alger, Luce, Northern Schoolcraft, and Chippewa
Southeast = Delta, Southern Schoolcraft, and Mackinac

Forecaster Note: The FWF is created in GFE, called "Our FWF." If a RFW has been issued, the formatter will automatically break out the appropriate counties.

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FIRE WEATHER PLANNING FORECAST FOR UPPER MICHIGAN
NATIONAL WEATHER SERVICE MARQUETTE MI
427 AM EDT SAT NOV 1 2008

...DRY TODAY THEN A CHANCE OF SHOWERS ON SUNDAY...

.DISCUSSION...HIGH PRESSURE OVER ONTARIO THIS MORNING WILL BRING DRY WEATHER
TO UPPER MICHIGAN TODAY AND TONIGHT BEFORE A LOW PRESSURE TROUGH MOVING IN
FROM THE NORTHWEST BRINGS A CHANCE OF RAIN SUNDAY INTO SUNDAY NIGHT. HIGH
PRESSURE WILL THEN RESULT IN DRY WEATHER AND A SLIGHT WARM UP FOR MONDAY AND
TUESDAY. TEMPERATURES WILL AVERAGE WELL ABOVE NORMAL FROM SUNDAY INTO THE
MIDDLE OF THE COMING WEEK.

MIZ002-009-084-021100-
WEST - GOGEBIC...ONTONAGON AND SOUTHERN HOUGHTON COUNTIES-
427 AM EDT SAT NOV 1 2008 /327 AM CDT SAT NOV 1 2008/

.TODAY...
SKY/WEATHER.........PARTLY CLOUDY.
MAX TEMPERATURE.....AROUND 52.
   24 HR TREND......UNCHANGED.
MIN HUMIDITY........30-35 PERCENT.
   24 HR TREND......UNCHANGED.
AIRPORT WINDS.......SOUTHEAST 5 MPH OR LESS.
PCPN AMOUNT.........NONE.
HOURS OF SUN........7.
LAL.................1.

.TONIGHT...
SKY/WEATHER.........MOSTLY CLOUDY.
MIN TEMPERATURE.....32-37.
   24 HR TREND......10 DEGREES WARMER.
MAX HUMIDITY........76-81 PERCENT INLAND TO 69 PERCENT AT THE SHORE.
   24 HR TREND......28 PERCENT DRIER.
AIRPORT WINDS.......SOUTHEAST 5 MPH OR LESS INCREASING TO SOUTH 5
                    TO 10 MPH BY MIDNIGHT...THEN INCREASING TO 10
                    TO 15 MPH LATE.
PCPN AMOUNT.........NONE.
LAL.................1.

.SUNDAY...
SKY/WEATHER.........MOSTLY CLOUDY. A SLIGHT CHANCE OF RAIN SHOWERS.
MAX TEMPERATURE.....AROUND 54.
MIN HUMIDITY........60-65 PERCENT.
AIRPORT WINDS.......SOUTH 10 TO 15 MPH BECOMING 15 TO 20 MPH
                    BY LATE MORNING...THEN BECOMING 10 TO 15 MPH BY
                    MID AFTERNOON.
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PCPN AMOUNT.........NONE TO 0.06 IN.
HOURS OF SUN........3.
LAL.................1.

$$

.FORECAST DAYS 3 THROUGH 7...

.MONDAY...PARTLY TO MOSTLY CLOUDY. PATCHY FOG EARLY WEST AND
CENTRAL. LOWS 36 TO 46. HIGHS 55 TO 63...WARMEST WEST. SOUTH
WINDS 5 TO 10 MPH.
.TUESDAY...PARTLY TO MOSTLY CLOUDY. A CHANCE OF SHOWERS WEST. LOWS
46 TO 50. HIGHS 55 TO 63. SOUTH WINDS 10 TO 15 MPH.
.WEDNESDAY...A CHANCE OF SHOWERS. MOSTLY CLOUDY. LOWS 44 TO 50.
HIGHS 55 TO 60. SOUTH WINDS 10 TO 15 MPH.
.THURSDAY...MOSTLY CLOUDY. A CHANCE OF LIGHT RAIN. A CHANCE OF
SNOW SHOWERS LATE. LOWS AROUND 43. HIGHS 49 TO 54.
.FRIDAY...COLDER. MOSTLY CLOUDY. A CHANCE OF RAIN AND SNOW
SHOWERS. LOWS 30 TO 35 INLAND TO AROUND 37 AT THE SHORE. HIGHS
37 TO 42.

.OUTLOOK FOR SAT NOV  8 THROUGH FRI NOV 14...EXPECT BELOW NORMAL
TEMPERATURES AND ABOVE NORMAL PRECIPITATION.

$$
...................SMOKE MANAGEMENT FORECAST DATA...................

THE FOLLOWING VALUES ARE FOR 1 PM EST (2 PM EDT) TODAY...

                          HAINES    MIXING  TRANSPORT  VENTILATION
WIMS ID/         SITE/     INDEX  / HEIGHT /  WIND    /    INDEX
-------------------------------------------------------------------
471301 /    WAUSAUKEE/ 4 LOW       / 3000  / NE 5     /   150 (F)
              KENTON/ 4 LOW       / 3000  / NE 5     /   150 (F)
       /     MUNISING/ 4 LOW       / 3000  / N 5      /   175 (F)
201002 /     DOE LAKE/ 4 LOW       / 3500  / N 5      /   175 (F)
201103 /  HIGH BRIDGE/ 4 LOW       / 3300  / N 5      /   165 (F)
200703 /        GWINN/ 4 LOW       / 3200  / N 5      /   160 (F)
200903 /    LABRANCHE/ 4 LOW       / 3400  / N 5      /   170 (F)
200503 /       PELKIE/ 4 LOW       / 3600  / N 3      /   108 (P)
201504 /         RACO/ 4 LOW       / 3500  / N 3      /   105 (P)
200802 /    RANDVILLE/ 4 LOW       / 3100  / N 5      /   155 (F)
201401 /       REXTON/ 4 LOW       / 3500  / N 4      /   140 (F)
201505 /      RUDYARD/ 4 LOW       / 3700  / N 3      /   111 (P)
201202 /        SENEY/ 4 LOW       / 3600  / N 4      /   144 (F)
201302 /SPINCICH LAKE/ 4 LOW       / 3500  / N 4      /   140 (F)
201102 /   STONINGTON/ 4 LOW       / 3300  / N 5      /   165 (F)
200102 /    WAKEFIELD/ 4 LOW       / 2700  / NE 3     /   81 (P)
200103 /   WATERSMEET/ 4 LOW       / 2800  / N 3      /   84 (P)
       /DRUMND ISLAND/ 4 LOW       / 3600  / N 4      /   144 (F)
       /          KEW/ 4 LOW       / 2700  / NW 3     /   81 (P)

THE FOLLOWING VALUES ARE FOR 1 PM EST (2 PM EDT) SUN...
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```
                          HAINES    MIXING  TRANSPORT  VENTILATION
WIMS ID/         SITE/     INDEX  / HEIGHT /  WIND    /    INDEX
-------------------------------------------------------------------
471301 /    WAUSAUKEE/ 2 VERY LOW  / 2000  / S 23    /   460 (G)
             KENTON/ 2 VERY LOW  / 2000  / S 23    /   460 (G)
       /     MUNISING/ 4 LOW       / 2000  / S 26    /   520 (G)
201002 /     DOE LAKE/ 4 LOW       / 2000  / S 26    /   520 (G)
201205 /  HIGH BRIDGE/ 4 LOW       / 2100  / S 24    /   504 (G)
200703 /        GWINN/ 2 VERY LOW  / 2000  / S 27    /   540 (G)
200903 /    LABRANCHE/ 2 VERY LOW  / 2300  / S 24    /   552 (G)
200503 /       PELKIE/ 2 VERY LOW  / 2200  / SW 28   /   616 (E)
201504 /         RACO/ 4 LOW       / 2200  / S 21    /   462 (G)
200802 /    RANDVILLE/ 2 VERY LOW  / 2200  / S 25    /   550 (G)
201401 /       REXTON/ 4 LOW       / 1900  / S 20    /   380 (G)
201505 /      RUDYARD/ 4 LOW       / 2300  / S 19    /   437 (G)
201202 /        SENEY/ 4 LOW       / 2300  / S 24    /   552 (G)
201302 /SPINCICH LAKE/ 4 LOW       / 2100  / S 24    /   504 (G)
201102 /   STONINGTON/ 3 VERY LOW  / 2200  / S 24    /   528 (G)
200102 /    WAKEFIELD/ 2 VERY LOW  / 1900  / SW 31   /   589 (G)
200103 /   WATERSMEET/ 2 VERY LOW  / 1700  / SW 31   /   527 (G)
       /DRUMND ISLAND/ 4 LOW       / 2800  / S 20    /   560 (G)
       /          KEW/ 2 VERY LOW  / 1000  / SW 27   /   270 (F)

NOTE:  MIXING HEIGHTS ARE IN FEET ABOVE GROUND LEVEL
       TRANSPORT WINDS ARE IN MILES PER HOUR

.....................................................................

THE FOLLOWING IS POINT FORECAST INFORMATION VALID AT 1 PM EST.
NOTE THAT THE QPF IS FROM 7 AM TO 1 PM EST. ALSO...WIND SPEEDS HAVE
BEEN REDUCED BY A FACTOR OF 0.7 BY THE REQUEST OF LOCAL FIRE OFFICIALS.

WIMS ID/         SITE/TEMP/  RH/WSPD/WDIR/ QPF
-----------------------------------------
471301 /    WAUSAUKEE/  47/  45/   4/   E/0.00
       /       KENTON/  46/  43/   2/   E/0.00
       /     MUNISING/  45/  45/   1/  NE/0.00
201002 /     DOE LAKE/  45/  45/   1/  NE/0.00
201205 /  HIGH BRIDGE/  45/  47/   2/  NE/0.00
200703 /        GWINN/  45/  46/   1/   E/0.00
200903 /    LABRANCHE/  46/  45/   2/   E/0.00
200503 /       PELKIE/  46/  48/   1/  SE/0.00
201504 /         RACO/  43/  48/   2/   N/0.00
200802 /    RANDVILLE/  47/  45/   1/   E/0.00
201401 /       REXTON/  44/  45/   2/   N/0.00
201505 /      RUDYARD/  42/  49/   3/   N/0.00
201202 /        SENEY/  44/  45/   1/   N/0.00
201302 /SPINCICH LAKE/  44/  47/   2/   N/0.00
201102 /   STONINGTON/  45/  48/   2/   E/0.00
200102 /    WAKEFIELD/  48/  41/   1/  SE/0.00
200103 /   WATERSMEET/  47/  45/   1/  SE/0.00
       /DRUMND ISLAND/  42/  58/   1/   N/0.00
       /          KEW/  45/  55/   2/   S/0.00
```

Time of issuance is located in the header of the product and is given in local time.

A headline is usually added, which describes the most important features of the period. In the case of a Red Flag Warning or Fire Weather Watch, information the reason, time frame, and areal coverage will be discussed.

Example:

...RED FLAG WARNING TODAY FOR SOUTH CENTRAL UPPER MICHIGAN INCLUDING PORTIONS OF THE OTTAWA NATIONAL FOREST FOR LOW HUMIDITY AND STRONG WIND...

.DISCUSSION...

The discussion is a brief synopsis of the current conditions and what can be expected over the next 2 days, but may extend farther out if conditions are expected to significantly influence fire operations. It will include the mention of major weather features expected to affect the forecast area, along with any fire weather specific concerns of low humidity, high winds, high temperatures, or frost. We will make every effort to not use the phrases “near red flag conditions” or “fire danger,” as this may create confusion. The discussion should be 8 lines or less, unless extreme fire weather deems otherwise.

SKY/WEATHER

The prevailing sky conditions across the area, given as Clear, Sunny, Mostly Sunny, Partly Cloudy, Partly Sunny, Mostly Cloudy, or Cloudy. There is a wide variety of weather options including a chance of rain showers, or a chance of showers and thunderstorms.

The chance of precipitation ranges from 0 to 100 percent. This value indicates the percent probability that any one location will receive measurable rain of 0.01 inches or greater.

0 - 14%	=	None, unless flurries, sprinkles, or drizzle
15 - 30%	=	Slight chance or isolated
31 - 60%	=	Chance, widely scattered, or scattered
61 - 80%	=	Likely or numerous
80 - 100%	=	Definite

MAX/MIN TEMPERATURE
24 HOUR TREND

Maximum and minimum temperatures are forecast in degrees Fahrenheit. Maximum temperatures will be given during the daytime hours, and minimum temperatures for the overnight. 24 Hour Trend is a value, positive or negative, depicting the difference between the maximum or minimum temperatures of the previous day to those expected that period.

MAX/MIN HUMIDITY
24 HR TREND

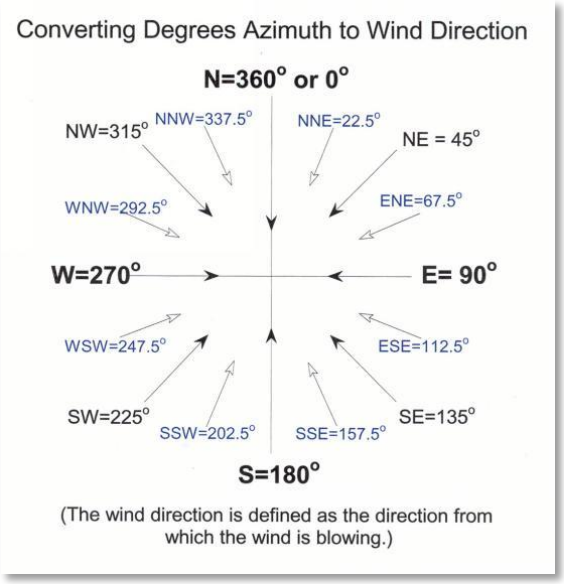
The relative humidity is the ratio, in percent, of the amount of moisture in the air compared to the amount the air could hold if it were fully saturated (100%). Maximum values are given for the overnight periods, while minimum values are for the daytime hours.

Forecaster Note: There are a couple of tools one can use to calculate relative humidity. The old-fashioned psychrometric calculator works fine, allowing the forecaster to visualize a range of values based on expected temperatures and dew points Also, here's a crude rule of thumb: for every 20F of dewpoint depression, the RH drops by 50%. This rule of thumb works best when the temperature is around 80F; as temperatures grow hotter or colder than 80F, this rule becomes less accurate.

MOS guidance is also a valuable tool; however remember that maxima and minima often fall between output times. In other words, minimum relative humidities (and minimum dew points) may often be ~5% lower than a quick glance at MOS suggests.

AIRPORT WINDS

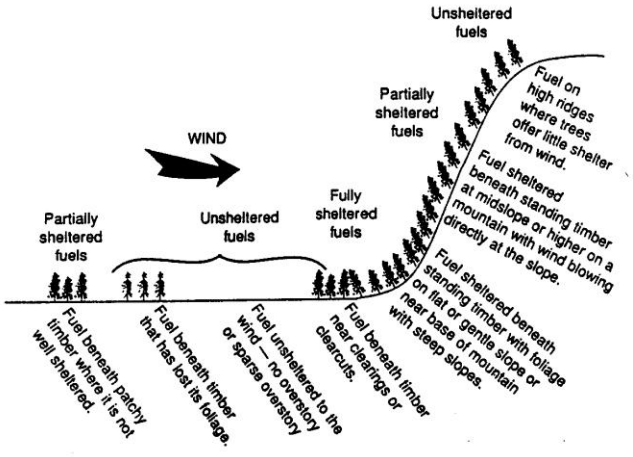
This value is a combination of wind direction and speed in mph. Significant gusts or erratic wind speed or direction changes will be included. Direction is given in the 8 cardinal points; the direction from which the wind is blowing. The 8 cardinal points are N, NE, E, SE, S, SW, W, and NW. Wind speed is given in miles per hour. Currently at the National Weather Service Office in Marquette, MI, the wind we place in this parameter is the traditional airport wind, or 10-meter (33-foot) wind. Due to land cover and specific location, a correction factor may be needed to get the 20-foot (*0.7 is standard for the NWS), mid flame, or other wind value of interest.



MI DNR / US BEHAVE Wind speed & Fire Shape

WIND ADJUSTMENT TABLE		MIDFLAME WINDSPEED							
Airport Winds		Fire Weather Obs		Unsheltered Fuels			Partial Shelter	Fully Sheltered	
		10m	20ft	FM 4	FM 13	Others		Open	Dense
1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1
1	1	1	1	1	1	0	0	0	0

2	2	2	1	1	1	1	1	0	0
3	3	2	2	2	2	1	1	1	0
4	4	3	3	2	2	2	1	1	0
5	5	4	4	3	3	2	2	1	1
6	5	5	4	4	3	2	2	1	1
7	6	6	5	4	4	3	2	1	1
8	7	6	6	5	4	3	2	2	1
9	8	7	6	5	5	4	3	2	1
10	9	8	7	6	5	4	3	2	1
11	10	9	8	7	6	4	3	2	1
12	11	10	8	7	6	5	4	2	1
13	12	10	9	8	7	5	4	3	1
14	13	11	10	8	7	6	4	3	1
15	14	12	11	9	8	6	5	3	2
16	14	13	11	10	8	6	5	3	2
17	15	14	12	10	9	7	5	3	2
18	16	14	13	11	9	7	5	4	2
19	17	15	13	11	10	8	6	4	2
20	18	16	14	12	10	8	6	4	2
21	19	17	15	13	11	8	6	4	2
22	20	18	15	13	11	9	7	4	2
23	21	18	16	14	12	9	7	5	2
24	22	19	17	14	12	10	7	5	2
25	23	20	18	15	13	10	8	5	3
26	23	21	18	16	13	10	8	5	3
27	24	22	19	16	14	11	8	5	3
28	25	22	20	17	14	11	8	6	3
29	26	23	20	17	15	12	9	6	3
30	27	24	21	18	15	12	9	6	3
40	36	32	28	24	20	16	12	8	4
50	45	40	35	30	25	20	15	10	5



1. No Wind Adjustment Downhill at night.

2. Generally, NWS wind forecasts are based on winds recorded at airports. These sites are usually much more exposed that our fire weather recording stations.

3. **Eye level winds** are the most appropriate to use in making fire behavior predictions in the US BEHAVE system. However, RAWS record windspeeds at **20 ft**. If you are using a NWS forecast product, or obtaining wind readings from a mast at 10m or 20ft at one of your fire weather sites, the eye level winds may be estimated from the chart above.

MI DNR CCFDRS Wind Speed & Fire Shape

Airport Winds	Fire Weather Obs Windspeed, mph		Eye Level Windspeed, mph		Fire Shape Length:Width	
	10m	20ft	Unsheltered	Sheltered	Unshelt.	Shelt.
1.0	0.8	0.7	0.5	0.3	O1a, O1b	C,M,D,S
1	1	1	1	0	1.4	1.0
2	2	1	1	1	1.4	1.0
3	2	2	2	1	1.4	1.0
4	3	3	2	1	2.3	1.1
5	4	4	3	2	2.6	1.2
6	5	4	3	2	2.9	1.3
7	6	5	4	2	3.2	1.4
8	6	6	4	2	3.2	1.4
9	7	6	5	3	3.4	1.6
10	8	7	5	3	3.6	1.8
11	9	8	6	3	3.8	1.9
12	10	8	6	4	4.0	2.1
13	10	9	7	4	4.0	2.1
14	11	10	7	4	4.2	2.3
15	12	11	8	5	4.4	2.5
16	13	11	8	5	4.5	2.7
17	14	12	9	5	4.6	2.9
18	14	13	9	5	4.7	2.9
19	15	13	10	6	4.8	3.1
20	16	14	10	6	5.0	3.3
21	17	15	11	6	5.1	3.5
22	18	15	11	7	5.2	3.7
23	18	16	12	7	5.2	3.7
24	19	17	12	7	5.4	3.9
25	20	18	13	8	5.5	4.1
26	21	18	13	8	5.6	4.3
27	22	19	14	8	5.8	4.5
28	22	20	14	8	5.8	4.5
29	23	20	15	9	5.9	4.7
30	24	21	15	9	6.0	4.9
40	32	28	20	12	6.3	5.4
50	40	35	25	15	6.9	6.4

Generally, NWS wind forecasts are based on winds recorded at airports. These sites are usually much more exposed than RAWS.

10 m winds are the most appropriate to use in determining Initial Spread Index (ISI) and making fire behavior predictions. However, our fire weather recording stations record windspeeds at **20 ft**. If you are taking eye level winds, working with a NWS forecast product, or obtaining 20 ft readings from our fire weather sites, the 10 m winds may be estimated from the chart above.

PCPN AMOUNT

Precipitation amount is given in tenths of an inch (in), and is the average amount expected when precipitation is forecast. When the chance of precipitation is 14% or less a value of 0 will be given. At values at or above 15%, a range of probably values is given (example 0.12 to 0.25 inches). A chance of precipitation (up to 60%) may also begin with a range of no precipitation, at the forecasters discretion (example, None to 0.12). This may be appropriate when spotty showers are expected or event uncertainty is high.

LAL

LAL or Lightning Activity Level describes the intensity or frequency of thunderstorms if forecast, otherwise a value of 1 is given. Since the objective is to describe the lightning activity, lightning counts take precedence over the cloud-storm-rain narrative descriptions. For instance, if the clouds fit the LAL 3 descriptive criteria, but the lightning average 3 cloud-to-ground discharges per minute, the LAL should be classified as a 4.

Lightning Activity Level Values		
	Cloud and Storm Development	*Cloud to Ground Lightning Strikes 5 min (15 min)…areal coverage*
1	No Thunderstorms	None…0%
2	Cumulus clouds are common but only a few reach the towering cumulus stage. Light rain will occasionally reach the ground. Lightning is very infrequent.	1-5 (1-8)…1-14%
3	Towering cumulus covers less than two-tenths of the sky. Thunderstorms are few, but two to three must occur within the observation area. Light to moderate rain will reach the ground, and lighting is infrequent.	6-10 (9-15)…15-24%
4	Towering cumulus covers two to three-tenths of the sky. Thunderstorms are scattered. Moderate rain is common and lightning is frequent.	11-15 (16-25)…25-54%
5	Towering cumulus and thunderstorms are numerous, covering more than three-tenths of the sky. Rain is moderate to heavy, with frequent and intense lightning.	>15 (>25)…>54%
6	Similar to LAL 3 except thunderstorms are dry.	

.FORECAST DAYS 3 THROUGH 7...

This portion of the forecast will contain general temperatures, sky conditions, and precipitation expected through the remainder of the 7 day forecast period. Winds will be included when they are significant.

.OUTLOOK FOR 8 TO 14 DAYS…

This extended outlook is taken from a daily forecast produced by the Climate Prediction Center, http://www.cpc.ncep.noaa.gov/products/predictions/814day/ . It includes temperature and precipitation probabilities compared to seasonal normal values for the time periods. Values of near normal, above normal, or below normal will be given.

.....SMOKE MANAGEMENT FORECAST DATA.....

This section includes the 1 pm EST (2 pm EDT) Haines Index, Mixing Height, Transport Winds, and Dispersion for different RAWS sites for current day and the next day (day 2).

HAINEX INDEX

Haines Index is the sum of a stability term and a moisture term. The sum provides an indication of the potential for wildfire growth and extreme behavior of a fire on a given day. A Haines Index of 2-3= Very Low, 4= Low, 5=Moderate, and 6= High. We use the low-elevation formula, which is as follows:

Stability Term **(T950-T850)**	***Moisture Term*** **(T850-Td850)**
1...3 C or less	**1**...5 C or less
2...4 to 17 C	**2**...6 to 9 C
3...8 C or greater	**3**...10 C or greater

MIXING HEIGHT

The mixing height is the depth of the unstable air in the boundary layer and is used for forecasting smoke or pollutant trajectories, in feet above ground level (FT-AGL).

Forecaster Note: The Miller-Holzworth can be employed to calculate mixing height, but is a very basic, and assumes stability is based only on solar insolation, and does not take into account any changes in airmass during the day. Subsidence inversions, precipitation (non dry adiabatic parcel ascent), and upward vertical motion will usually result in different values. To estimate morning mixing heights, add 5 degrees C to the minimum surface temperature. Then follow the dry adiabat to the intersection of the 12Z sounding. The height above the ground is the predicted morning height. Afternoon mixing heights can be forecast in much the same manner. The predicted maximum temperature is followed up the dry adiabat to the intersection of the 12Z sounding. This level is the forecast of the afternoon mixing height.

TRANSPORT WIND

Transport wind is defined as the average wind speed in all directions of all winds within the layer bounded by the surface and the mixing height. Transport winds provide land managers with information about the horizontal dispersion (location and distance downwind from the source) or suspended particles from prescribed fires.

VENTILATION INDEX

Smoke dispersal improves as the mixed layer and transport wind increase. A derived value used to indicate smoke dispersal is the ventilation index, which may also be called the clearing index:

Ventilation Index = {mixing height (ft agl)*transport winds (mph)}/ 100

Value		Rating
Less than 130	=	Poor (P)
130 – 299	=	Fair (F)
300 – 599	=	Good (G)
600 +	=	Excellent (E)

THE FOLLOWING IS POINT FORECAST INFORMATION VALID AT 1 PM EST.

The Point Forecast includes TEMP (temperature), RH (relative humidity), WSPD (wind speed), WDIR (wind direction), and QPF (quantitative precipitation forecasts). These forecasts are valid for each RAWS site at 1 pm EST (2 pm EDT).

2. Conference Calls

NWS Marquette and the Michigan Interagency Wildland Fire Protection Association (MIWFPA) will hold a conference call every Friday at 10 am Eastern as needed during the fire season. The day and time is flexible, and may be changed as needed. The conference call will be used to coordinate current weather, status of fuels, and the potential need for any Fire Weather Watches over the upcoming week. Calls will likely take place through spring green up and during any prolonged dry periods through the fire weather season. Depending upon the current fire weather conditions, additional calls may be needed during the week. The NWS will typically start off the call, followed by a discussion by MIWFPA agencies about available fuels, fire behavior, and resources.

xxx-xxx-xxxx (participant code xxxxxxx)

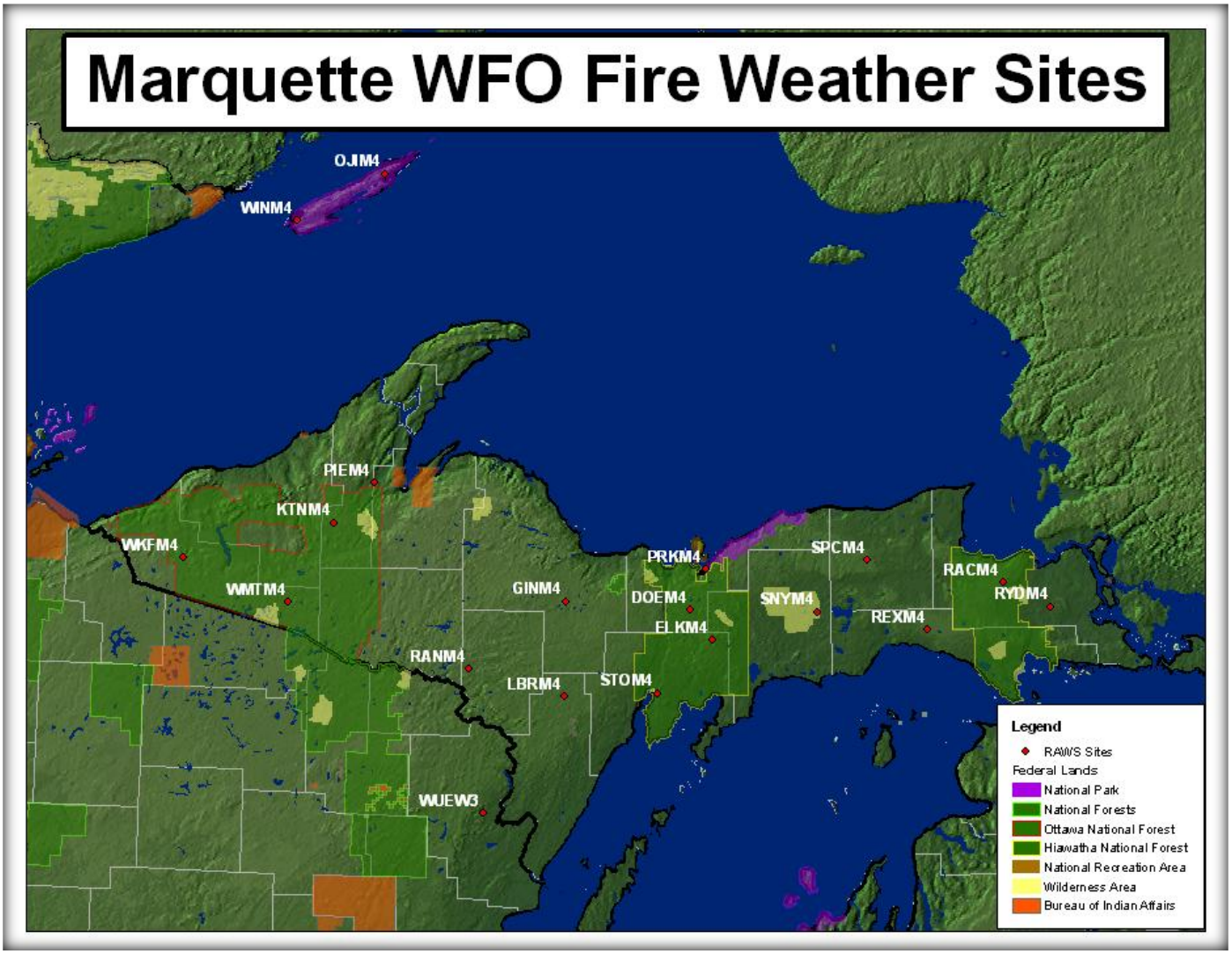
The backup number will be the NWS MQT conference call number
xxx-xxx-xxxx (participant code xxxxxxx)
(leader code xxxxxxx)

Forecaster Note:
The forecaster working the short term desk (I shift) will typically participate in the call. Do not give the phone number/code to anybody other than MIWFPA share holders or the EACC Meteorologist.

3. Fire Weather Matrix (ARBFWMMQT) for National Fire Danger Rating System

The Fire Weather Matrix in a part of the The National Fire Danger Rating System (NFDRS). NFDRS evaluates complex model and fuel parameters as a quantitative means for evaluating the fire danger across a vast area such as a forest. The input values include daily weather observations, fuel moisture, and our Fire Weather Matrix. Fire managers receive numeric output that suggests the severity of fire danger over a large area. Note: Elkhorn, was moved and renamed High Bridge in 2009. Kenton was also started in 2009. Watersmeet is expected to move in 2010, probably less than 5 miles, and keep its name.

Station Name (NFDRS Zone)	Station ID#	County	Controlling Agency	Elevation (ft)
Windigo/WINM4 (951)	200403	Keweenaw	NPS	830
Ojibway/OJIM4 (951)	200405	Keweenaw	NPS	1040
Wakefield/WKFM4 (952)	200102	Gogebic	MDNRE	1200
Watersmeet/WMTM4 (951)	200103	Gogebic	USFS	1605
Kenton/KNTM4	N/A	Houghton	USFS	1262
Pelkie/PIEM4 (None)	200503	Baraga	MDNRE	1000
Randville/RANM4 (951)	200802	Dickinson	MDNRE	1255
Gwinn/GINM4 (950)	200703	Marquette	MDNRE	1225
Labranche/LBRM4 (None)	200903	Menominee	MDNRE	1000
Doe Lake/DOEM4 (950)	201002	Alger	USFS	815
Munising/PRKM4	N/A	Alger	NPS	771
Stonington/STOM4 (949)	201102	Delta	USFS	653
High Bridge/HBRM4 (949)	201103	Delta	USFS	840
Seney/SNYM4 (950)	201202	Schoolcraft	USFWS	702
Spincich Lake/SPCM4 (951)	201302	Luce	MDNRE	896
Rexton/REXM4 (None)	201401	Mackinac	MDNRE	862
Raco/RACM4 (948)	201504	Chippewa	USFS	900
Rudyard/RYDM4 (None)	201505	Chippewa	MDNRE	700



a) Issuance (seasonal, daily)

The FWM, or Fire Weather Matrix point forecast product, is produced on a seasonal basis, similar to the Fire Weather Planning Forecast. This coded forecast is produced for 5 NFDRS RAWS sites in the forecast area on a routine basis, as observations are completed in the Weather Information Management System (WIMS) by the user agency. Additional sites may be added upon request to the fire weather focal point.

Forecaster Note: The FWM is created in the GFE Formatter Launcher, "Our FWM," and sent by the final NMCFWOER collective (typically by 3:45 pm EST). Select the sites that arrived in the 2 NMCFWOER products as Official, and run the formatter (O for Official, F for Forecast). Click *Transmit* to send the point forecasts after editing the forecast values. Check the latest observations, and make necessary changes to max/min temperature and relative humidity values. Add hours of precipitation by hand if needed.

b) Content

FNUS83 KMQT 261945
FWMMQT

FCST,200103,030127,13,2,17,92,1,1,NW,10,M,18,10,98,56,1,0,N

FCST, Station, Date, 13, Wx, T, RH, L1, L2, WD, WS, M, TM, TN, HM, HN, P1, P2, N

Decoding the FWM (Fire Weather Matrix)
NOTE: All times are given in Eastern Standard/Daylight time. Adjust as needed for Central Time zone.

Station – NFDRS station number (starts with 20, indicating Michigan)
Date – ddhhmm (day, hour, minute)
13 – indicates that the forecast is valid at 1300 LST (18Z), this is a constant
Wx – state of weather given as a value of 0 through 9, at 18Z (1 pm EST / 2 pm EDT) tomorrow.

0 = Clear sky
1 = Scattered clouds
2 = Broken clouds
3 = Cloudy
4 = Fog
5 = Drizzle
6 = Rain
7 = Snow/sleet
8 = Showers
9 = Thunderstorms

T – temperature at 18Z (1 pm EST / 2 pm EDT) tomorrow (˚F)
RH – relative humidity at 18Z (1 pm EST / 2 pm EDT) tomorrow (%)
L1 – lightning activity level from 19Z today to 04Z tonight; 2 pm EST (3 pm EDT) to 11 pm EST (midnight EDT)
L2 – lightning activity level for 24 hours, from 04Z tonight until 04Z tomorrow night; 11 pm EST (midnight EDT) to 11 pm EST (midnight EDT)

Lightning Activity Level Guide (Coverage)

1 = No T-storms
2 = Isolated T-storms (1-14% coverage)
3 = Widely Scattered T-Storms (15-24% coverage)
4 = Scattered T-storms (25-54% coverage)
5 = Numerous (55+% coverage)
6 = Dry Lightning, when >=15% coverage and little or no rain

WD – wind direction at 18Z (1 pm EST / 2 pm EDT) tomorrow, using a 16-point compass (N, NNE, NE…)
WS – wind speed at 18Z (1 pm EST / 2 pm EDT) tomorrow (mph)

M – Missing, constant M given in place of forecast fuel moisture

TM – maximum temperature from 18Z (1 pm EST / 2 pm EDT) today until 18Z (1 pm EST / 2 pm EDT) tomorrow (˚F)
TN – minimum temperature from 18Z (1 pm EST / 2 pm EDT) today to 18Z (1 pm EST / 2 pm EDT) tomorrow (˚F)

HM – maximum humidity from 18Z (1 pm EST / 2 pm EDT) today to 18Z (1 pm EST / 2 pm EDT) tomorrow (%)
HN – minimum humidity from 18Z (1 pm EST / 2 pm EDT) today to 18Z (1 pm EST / 2 pm EDT) tomorrow (%)

P1 – hours of precipitation from 18Z (1 pm EST / 2 pm EDT) today until 10Z (500 am EST / 6 am EDT) tomorrow
P2 – hours of precipitation from 10Z (5 am EST / 6 am EDT) tomorrow until 18Z (1 pm EST / 2 pm EDT) tomorrow

WF – wet flag is used to indicate if fuels will be wet at 18Z tomorrow (1 pm EST / 2 pm EDT), and is given as Y or N. If Y is used, then all indices will be forced to zero. N is most common. A 75% or greater probability of precipitation at 18Z tomorrow (1 pm EST / 2 pm EDT) will result in a Y.

c) WIMS ID contact

All fire weather stations have been assigned numbers to be used as the identification number when entering into the Weather Information Management System (WIMS). If a new station is established, or a present station is moved, a new identification number should be requested from the Eastern Area GACC Meteorologist, in coordination with WIMS and the National Weather Service.

4. Site-specific wildland fire forecasts (Spot)

Spot Forecasts are are issued when requested by Interagency Wildland Fire Agencies for wildland fires or planned burn operations and are available 24 hours a day. They differ from our routine fire weather forecasts by incorporating greater detail in timing, higher resolution of terrain influences, as well as meso-scale and sometimes micro-scale weather influences impacting the site.

A Spot Forecast may also be requested for non-fire incidents or events. Examples would include search and rescue, HAZMAT, or other situation where the information would be critical to public safety. The request must be made by a government or contract government official (federal, state, tribal, or local).

a) Criteria

Before we issue a forecast for a particular site, we need detailed information about the site, who is making the request, and why. Some of these site details include elevation, latitude, longitude, and aspect. The more information we receive about a burn site, the more accurate our forecasts tend to be. Current weather information is of great benefit if available, including temperature, wind speed, and relative humidity. We will also need to know the requesting agency, project name, phone number, and effective time for the requested forecast. The turnaround time between the request and forecast issuance is typically between 30 and 40 minutes.

Forecaster Note: If the online NWSpot program is down, complete requests using Form D-1 (located at the link above, or in a dark blue folder in the data desk area). If a spot forecast is completed using the D-1 form, make a note in the shift log and place a hard copy in Jason's mailbox.

To compose a spot forecast, create/update any appropriate grids. Use the Formatter Launcher in GFE, "Our Spot Forecast," and select *Our Spot Forecast* from the *Products* menu. Click the *Run Formatter* button. Select the appropriate spot request. Fill in the appropriate boxes pertaining to the request, and click *OK*. Edit the spot forecast as needed, paying special attention local weather features and how they relate to any available observations. Large ranges are of little help to the user, to try to be as specific as possible. Be sure to address specific questions that came in the request, either in the synopsis or elsewhere. Do not use the term "Red Flag" within the spot forecast unless a Red Flag Warning is in effect!

Once completed, the Spot Forecast will be relayed back to the requesting agency via the NWSPOT program.

b) Content

A Spot Forecast traditionally contains sky conditions, weather, temperature, relative humidity, and wind speed.

Optional Spot Forecast elements include…

- Sky/Weather
- Temperature
- Relative Humidity
- General Wind (Note: This will be the same wind as discussed in the Fire Weather Planning Forecast (Airport Winds). General Wind is utilized, as the term Airport Wind is not an option in the NWS Spot template.)
- Haines Index
- Smoke Dispersion (Transport Winds and Ventilation Index)
- Lightning Activity Level
- Mixing Height
- Wind Wave
- Rainfall Amount
- Additional information upon request

PRIMARY FORECAST ELEMENTS

TDA	TNT	TMR (Today, Tonight, Tomorrow)
☐	☐	☐ Sky / Weather
☐	☐	☐ Temperature
☐	☐	☐ Relative Humidity
☐	☐	☐ General Wind
☐	☐	☐ Haines Index
☐	☐	☐ Smoke Dispersion
☐	☐	☐ Lightning Activity Level
☐	☐	☐ Mixing Height
☐	☐	☐ Wind Wave
☐	☐	☐ Rainfall Amount

All parameters, excluding Dispersion and Wind Wave, are discussed in length in the Fire Weather Planning Forecast section of this Annual Operating Plan.

DISPERSION

Clicking on the option for dispersion will result in the following 2 parameters, Transport Winds and Ventilation Index. The Ventilation Index was discussed in the Fire Weather Planning Forecast section. The Transport Wind is the average wind speed and direction in the mixed layer.

WIND WAVE

Wind Wave is the wave height in feet (ft). This parameter is, in our case, available over most of Lake Superior and northern Lake Michigan. It is especially important for search-and-rescue, spills, incidents, or near water fire operations.

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IF CONDITIONS BECOME UNREPRESENTATIVE,
CONTACT THE NATIONAL WEATHER SERVICE.

SPOT FORECAST FOR HEIKKILA OAK...MI DNRE
NATIONAL WEATHER SERVICE MARQUETTE MI
1019 AM EDT TUE MAY 20 2008

FORECAST IS BASED ON IGNITION TIME OF 1100 EDT ON MAY 20.
IF CONDITIONS BECOME UNREPRESENTATIVE...CONTACT THE NATIONAL WEATHER
SERVICE.

.DISCUSSION...LOW PRESSURE OVER SOUTHEAST CANADA WILL MAINTAIN A
COOL NORTHWEST FLOW THROUGH WEDNESDAY. EXPECT NORTHWEST WINDS
GENERALLY IN THE 10 TO 15 MPH RANGE TODAY WITH GUSTS OCCASIONALLY
INTO THE 20 TO 25 MPH RANGE. LOOK FOR INCREASING CLOUD COVER THROUGH
THE DAY. A LOW PRESSURE TROUGH MOVING THROUGH THE AREA TONIGHT MAY
BRING A FEW SPRINKLES. ANOTHER TROUGH ON WEDNESDAY WILL BRING A
CHANCE OF A FEW LIGHT SHOWERS. HIGH PRESSURE WILL THEN BUILD INTO THE
REGION THROUGH THE END OF THE WEEK...BRINGING A WARMING TREND WITH
NO PRECIPITATION.

.TODAY...

SKY/WEATHER.........MOSTLY SUNNY THEN BECOMING MOSTLY CLOUDY.
MAX TEMPERATURE.....53 AT IGNITION...MAX 58.
MIN HUMIDITY........42 PERCENT AT IGNITION...MIN 37 PERCENT.
GENERAL WIND........WINDS NORTHWEST AT 11 MPH AT IGNITION...
                    OTHERWISE NORTH WINDS 7 TO 12 MPH INCREASING
                    TO NORTHWEST 10 TO 15 MPH.
HAINES INDEX........4...OR LOW POTENTIAL FOR LARGE PLUME DOMINATED
                    FIRE GROWTH.
TRANSPORT WINDS.....NORTHWEST 16 TO 35 MPH INCREASING TO 24 TO 40
                    MPH LATE.
VENTILATION INDEX...GOOD (350) INCREASING TO EXCELLENT (2099).
LAL.................1.
MIXING HEIGHT.......300-1800 FT AGL INCREASING TO 7500-8000 FT AGL.
RAINFALL AMOUNT.....0.00 INCHES.

TIME (EDT)       11 AM  1 PM   3 PM   5 PM   7 PM
SKY (%).....36     64     75     81     80
WEATHER COV......
WEATHER TYPE.....NONE   NONE   NONE   NONE   NONE
TEMP.............53     56     57     56     53
RH...............42     38     37     37     40
GENERAL WIND.....NW 11  NW 11  NW 12  NW 12  NW 11
GENERAL WIND GUST20     20     25     25     20
HAINES INDEX.....4      4      4      4      4
```

c) Procedures

The preferred method for requesting and issuing a spot forecast is from our website: http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=mqt

If necessary, you may fax a Spot Request Form D-1 to our office or phone in the specific request. If you use this method, a call would be greatly appreciated to alert us of the arriving fax. This will expedite the process. Copies of the Spot Request Form D-1 can be downloaded from the following site, or made available upon request: http://www.weather.gov/directives/010/401f/WS_FORM_D_SPOT.pdf

Once sent, the forecasters will be alerted, as the product ARBSTQMQT alarms at the weather service office. A phone call to the forecast office is usually not needed, but may help clear up questions the forecasters may have about the request.

Once the forecast has been issued, the Spot website will auto-update. At the forecast office, the final forecast will also alert on the workstations, as the product ARBFWSMQT.

Feel free to test out our online request page. If you do send in a test request, please contact our office to tell one of the forecasters that you are doing so. If you have any questions about Spot requests feel free to give us a call. Feedback is greatly appreciated, either online or by phone.

5. Wildfire Potential Statement (ARBRFDMQT)

a) Criteria

A Wildfire Potential Statement (ARBRFDMQT) can be used as an outlook to potential critical fire weather conditions beyond when a Fire Weather Watch traditionally issued. It can also be utilized for those times when conditions do not quite meet specific Fire Weather Watch or Red Flag Warning criteria, but there will still be an elevated fire danger. The product briefly describes the fire danger, the weather conditions behind it, how long the conditions will last, and concludes with a brief call to action. A Special Weather Statement (SPS) may also be utilized for larger events, as it will automatically highlight on our website, and scroll on the Weather Channel.

Forecaster Note:

When a Wildfire Potential Statement has been issued, there is no need to include a special headline in the routine FWF. There is no requirement to update the statement at a certain time, but during a prolonged period of high fire danger RFDs should be issued at least once a day. No cancellation statement is needed when conditions improve. The RFD is created in GFE. Select the areas you want, with segments if appropriate. *Unless instructed to do otherwise by fire officials, avoid trying to describe the level of fire danger. Instead, use terms like elevated fire risk or increased fire potential. Only the u*se of the phrase "Extreme Fire Danger" in the headline of this product will activate the WWA maps (color coding on NWS web sites).

b) Content

```
WILDFIRE POTENTIAL STATEMENT
NATIONAL WEATHER SERVICE MARQUETTE MI
500 AM EDT THU APR 14 2006

...VERY HIGH FIRE RISK TO CONTINUE THROUGH THE WEEKEND...

HIGH PRESSURE CENTERED OVER HUDSON BAY...ALONG WITH A WEEK WITHOUT
RAINFALL...HAS RESULTED IN VERY DRY CONDITIONS AND AN INCREASED
WILDFIRE POTENTIAL ACROSS UPPER MICHIGAN. EXPECT NO RAINFALL AND
VERY LOW HUMIDITIES INTO THE WEEKEND...MAINTAINING THE VERY HIGH
FIRE RISK.

BECAUSE OF THE VERY HIGH FIRE RISK...POSTPONE ANY OUTDOOR
BURNING AT LEAST UNTIL NEXT WEEK. IF BURNING MUST BE DONE...CHECK
WITH LOCAL GOVERNMENTAL AGENCIES FOR ANY BURNING RESTRICTIONS THAT
MAY BE IN EFFECT.

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6. Fire Weather Watch, Red Flag Warning Program (ARBRFWMQT)

The Fire Weather Watches and Red Flag Warnings are issued to alert of combination of dry fuel and weather conditions that could result in extensive wildfire occurrence or extreme fire behavior. These conditions alert our land management agencies to the potential for widespread new ignitions or control problems with existing fires, both of which could pose a threat to life and property.

A **Fire Weather Watch** is issued 12 to 96 hours in advance of the onset of possible warning conditions.

A **Red Flag Warning** is issued within 24 hours of the event (or onset of warning conditions).

a) Criteria

The parameters used to define a watch or warning includes relative humidity, wind speed, and temperature, and fuel moisture (defined as a period of dry weather). Specific fuel moisture must be coordinated with our users.

- A dry spell for over a week (shorter before spring green-up or after fall color)
- Sustained Wind Speed > = 20 mph (10 m ASOS-Airport winds)
  or >= 15 mph (20 ft RAWS winds)
- Relative Humidity 25% or less
- Temperature 70 F or greater

Note: The temperature criterion is soft. Red Flag Warnings can be used for temperatures less than 70 degrees depending on other factors.

Initial watch/warning coordination may be accomplished during the semi-routine weekly MIWFPA conference call. If a Fire Weather Watch is already in effect and expected weather conditions still meet Red Flag Warning criteria, no ok is needed from MIWFPA to issue the Red Flag Warning. Once a Red Flag Warning is issued the different agencies of MIWFPA should be notified as soon as possible. If no Fire Weather Watch is in effect, then contact must be made with MIWFPA before a Red Flag Warning is issued. Contacts for MIWFPA coordination are listed below…

- Michigan DNR – Duty Officer
- Hiawatha NF, Pictured Rocks NL – Steve Nurse
- Seney NWR – Gary Lindsay
- Ottawa NF – Duty Officer
- US BIA – Will Wiggins

Once a decision is made to issue a Fire Weather Watch or Red Flag Warning, the Fire Weather Forecast should be updated accordingly. You must also notify the EACC Meteorologist, Steve Marien.

Forecaster Note: The expiration time of the RFW should line up with the issuance of the next FWF, unless conditions are anticipated to improve in the meantime. Also update the FWF, and AFD to include WWA coding.

b) Content

The following is an example of a Red Flag Warning; a fire weather watch would look very similar. The header will state whether it is a Fire Weather Watch or Red Flag Warning. This narrative product will be comprised of a headline followed by a brief statement with more detail as to where, when, and why the product has been issued.

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RED FLAG WARNING
NATIONAL WEATHER SERVICE MARQUETTE MI
601 AM EDT WED MAY 28 2008

...RED FLAG WARNING IN EFFECT FROM 2 PM EDT /1 PM CDT/ THIS
AFTERNOON TO 9 PM EDT /8 PM CDT/ THIS EVENING FOR NORTHWEST UPPER MICHIGAN...

.HIGH PRESSURE WILL REMAIN ACROSS THE AREA TODAY. EXPECT AFTERNOON RELATIVE
HUMIDITY TO BOTTOM OUT AS LOW AS 20 PERCENT AWAY FROM THE MODERATING
INFLUENCE OF THE LAKE SUPERIOR AS HIGH TEMPERATURES REACH 65 TO 70. NORTHWEST
UPPER MICHIGAN MISSED OUT ON WIDESPREAD RAIN THAT FELL ON SUNDAY. SUSTAINED
WEST WINDS WILL BE 10 TO 15 MPH THIS AFTERNOON AS WELL.

ALTHOUGH THE WINDS ARE NOT LIKELY TO BE AS STRONG ON THURSDAY AFTERNOON AND
THE RELATIVE HUMIDITY WILL BE A BIT HIGHER...DAYTIME HIGH TEMPERATURES ARE
FORECAST TO PEAK FROM 70 TO 75 AWAY FROM THE GREAT LAKES. SO THE ELEVATED
FIRE RISK WILL PERSIST THROUGH THURSDAY BEFORE A CHANCE OF SHOWERS RETURNS
LATE THURSDAY NIGHT AND FRIDAY.

MIZ001>004-009-084-290100-
/O.NEW.KMQT.FW.W.0001.080528T1800Z-080529T0100Z/
KEWEENAW-ONTONAGON-NORTHERN HOUGHTON-BARAGA-GOGEBIC-
SOUTHERN HOUGHTON-
601 AM EDT WED MAY 28 2008 /501 AM CDT WED MAY 28 2008/

...RED FLAG WARNING IN EFFECT FROM 2 PM EDT /1 PM CDT/ THIS AFTERNOON TO 9 PM
EDT /8 PM CDT/ THIS EVENING...

THE NATIONAL WEATHER SERVICE IN MARQUETTE HAS ISSUED A RED FLAG
WARNING...WHICH IS IN EFFECT FROM 2 PM EDT /1 PM CDT/ THIS AFTERNOON TO 9 PM
EDT /8 PM CDT/ THIS EVENING.

HIGH TEMPERATURES WILL WARM TO 65 TO 70 DEGREES TODAY AWAY FROM LAKE SUPERIOR
WITH RELATIVE HUMIDITY VALUES DROPPING TO AS LOW AS 17 TO 24 PERCENT THIS
AFTERNOON INTO THIS EVENING AWAY FROM LAKE SUPERIOR. WEST WINDS WILL BE 10 TO
15 MPH THIS AFTERNOON AND EARLY EVENING WITH CRITICAL FIRE WEATHER CONDITIONS
EXPECTED FROM 2 PM EDT TO 9 PM EDT TODAY. CONDITIONS WILL IMPROVE AFTER
SUNSET WITH TEMPERATURES FALLING...RELATIVE HUMIDITIES RISING AND WINDS DYING
DOWN.

A RED FLAG WARNING MEANS THAT CRITICAL FIRE WEATHER CONDITIONS ARE EITHER
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OCCURRING NOW...OR WILL SHORTLY. A COMBINATION OF STRONG WINDS...LOW RELATIVE
HUMIDITY...AND WARM TEMPERATURES WILL CREATE EXPLOSIVE FIRE GROWTH POTENTIAL.

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B. Special services, procedures for obtaining and billing

Special services could include teaching weather related courses or an on-site Incident Meteorologist (IMET).

When land management agencies wish for a fire weather forecaster to teach a course, the request should be made at least 3 weeks ahead of time. This can be done by calling or emailing the Fire Weather Program Manager(s). A one-day trip will not incur any costs to the requesting agency. However, with an overnight stay, travel expenses should be paid for by the requesting agency. In most cases reimbursement agreements are in place.

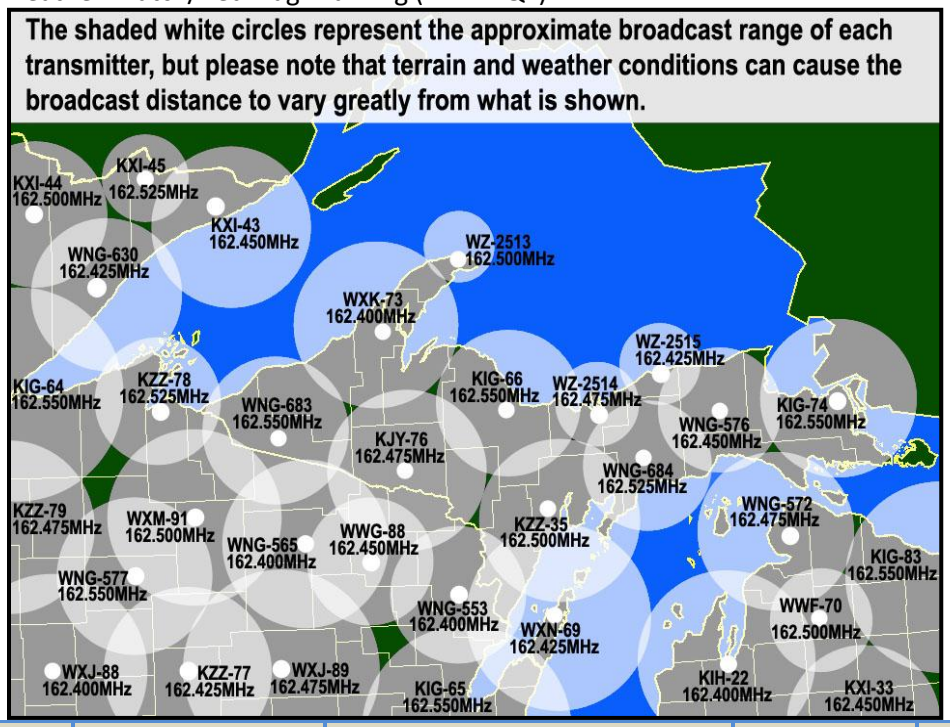
Please reference the Geographical Area Mobilization Guide and/or the National Mobilization Guide for details about IMET dispatches for wildland fire suppression operations.

C. NOAA Weather Radio All Hazards

The fire products listed below will play on NOAA Weather Radio All Hazards at various intervals from every broadcast cycle, every 10 minutes, or more infrequent as needed. The periodicity of each product will vary depending on the severity of the fire situation and the presence of additional weather hazards (example- severe thunderstorms, flooding, etc.). However, they are typically broadcast every 10 minutes. Please contact the Fire Weather Focal Point(s) with any periodicity change requests.

Wildfire Potential Statement (RFDMQT)

Fire Weather Watch/Red Flag Warning (RFWMQT)



Call Sign	Site Name	Site Location (County)	Frequency	Power
KZZZ78	Ashland	Ashland (Ashland)	162.525	1000
WZ2513	Copper Harbor	Copper Harbor (Keweenaw)	162.500	300
KJY76	Crystal Falls	Crystal Falls (Iron)	162.475	1000
KZZ35	Escanaba	Escanaba (Delta)	162.500	1000
WNG572	Emmet County	Emmet County (Cheboygan)	162.475	300
WZ2515	Grand Marais	Grand Marais (Alger)	162.425	100
WXK73	Houghton	Painesdale (Houghton)	162.400	1000
WNG84	Manistique	Steuben (Schoolcraft)	162.525	300
WNG683	Marinesco	Marinesco (Gogebic)	162.550	300
KIG66	Marquette	Negaunee (Marquette)	162.550	300
WZ2514	Munising	Munising (Alger)	162.475	100
WNG576	Newberry	Newberry (Luce)	162.450	300
KIG74	Sault St. Marie	Daftner (Chippewa)	162.550	1000
WXN69	Sister Bay	Sister Bay (Door)	162.425	1000
WNG553	Wausaukee	Wausaukee (Marinette)	162.400	1000

D. CRH Notification Requirements for Major Events

Forecaster Note:
If a major fire weather event occurs in Upper Michigan, it must be reported immediately to the MIC/AMIC, the EACC Meteorologist, and Central Region Headquarters (CRH), by phone. Such events are defined as:

1. Major fire weather occurrences resulting in:
    a. One or more directly related fatalities
    b. Numerous injuries
    c. Major property damage
    d. Significant media attention
2. Any request for the deployment of a fire weather incident forecaster (IMET).

To notify Central Region Headquarters:

1. Notify CRH through the answering service: 1-877-xxx-xxxx
2. When asked, enter the phone buttons for the WFO's three letter identifier followed by the * button. For WFO MQT this would be xxxx
3. When the system asks to press "1" for IT or Equipment outage support, or "2" for Services Issues, press "2"
4. When the system asks, provide the following information:
    a. Caller's name
    b. Time of call
    c. Callback phone number
    d. Message on why the call is being made and briefly address any significant known details.
    e. End the message by pushing the # button **(You must press this button or the message will be lost.)**
5. The system will give the caller the following options:
    a. Send the message
    b. Re-record the message
    c. Hang up

    Select Send the message
6. CRH will call back. Provide the following information to the CRH contact.
    For a wildfire:
    a. Time wildfire began, if known
    b. Location of wildfire
    c. Acreage burned, if known, and valid time of this information
    d. Percent contained if known, and valid time of this information
    e. Fatalities
    f. Injuries
    g. Damage
    h. Media coverage
    i. Warning or other product in effect

    For IMET deployment notification (Note: This can wait until daytime or early evening hours):
    1. Name of the IMET deployed

2. Wildfire to which the IMET is being deployed
3. The field office from which the IMET is being deployed
4. Time IMET scheduled to leave the field office and report to the wildfire site

7. Issue a "For the Record" memo (FTR) if the CRH contact decides this course of action. Guidelines for the FTR can be found in Chapter 1, Appendix 1.9-1 of the SDM. **This does not need to be done in the event of an IMET deployment.**

A complete description of our office's policy concerning the reporting of emergency or important events can be found in the NWS Marquette Station Duty manual, Volume 1, Chapter 1, Appendix 1.9-1. The information is also contained in NWSI 10-1603, NWS CR SUPP 05-2003.

In the event of a major fire weather event, contact the EACC Meteorologist, Stephen Marien.

E. National Weather Service Verification Methodology

Forecaster Note: (for internal use by the MQT Fire Weather team)
The Red Flag Warning/Fire Weather Watch Verification program is divided into four parts:

1. Red Flag Warnings/events for dry thunderstorms,
2. Red Flag Warnings/events for synoptic-scale (i.e., strong winds and/or low humidity and/or high temperatures),
3. The total of both types, and
4. Fire Weather Watch forecasts/events.

Verification of Red Flag Warnings and Fire Weather Watches will be tracked for each fire weather zone (or county in our case). For example, if a Red Flag Warning is issued for an area which is comprised of 5 fire weather zones, it will count as 5 Red Flag Warnings, one for each zone.

A Red Flag Warning issued at the request of a land management agency will not be considered for verification purposes. They will be tallied separately, and for the purpose of workload indication, be included in the number of total warnings issued.

Data from surface observations, satellite, and radar imagery, etc. may be used to verify (or to not verify) red flag warnings and fire weather watches. Experience, judgment, objectivity, consistency, and ethics must be used.

Since each WFO has unique red flag warning criteria, users, and data, local procedures for verifying red flag warnings will differ among WFOs. Due to these differences, verification stats from one WFO cannot realistically relate to another.

Computing POD, FAR, and CSI:

A: # of warnings that verified
B: # of warnings that did not verify
C: # of Red Flag events that occurred - but no warnings were issued

POD = A/(A+C)
FAR = (1-(A/(A+B)) or B/(A+B)
CSI = A/(A+B+C)

Each WFO must provide the regional fire weather program manager with the following statistics as soon as conveniently possible after the **Fiscal Year**. When computing lead times, if the Lead Time for an event is less than 5 minutes, a lead time of zero should be recorded. Also, input a Lead Time of zero for any red flag event that occurred without a warning.

1. **Dry Thunderstorm** RFW verification
   a. # of Red Flag Warnings issued for dry thunderstorms (DWI)
   b. #of Red Flag Warnings issued for dry thunderstorms that verified (DWV)
   c. # of verified Red Flag Warnings there were preceded by a Fire Weather Watch (DAP)
   d. # of Red Flag Warnings issued for dry thunderstorms that did not verify (DWN)
   e. # of dry thunderstorm events that occurred - but for which a Red Flag Warning was not issued (DEN)
   f. Sum of the Lead Times for all dry thunderstorm events (DLS)
   g. Average Red Flag Warning lead time for dry thunderstorm events (DLA) DLA=DLS/(DWV + DWN)

POD(D):
FAR(D):
CSI(D):

2. **Synoptic-Scale** RFW verification
   a. # of Red Flag Warnings issued for synoptic-scale Criteria (SWI)
   b. # of Red Flag Warnings issued for synoptic-scale events that verified (SWV)
   c. # of verified Red Flag Warnings issued for synoptic-scale events that were preceded by a Fire Weather Watch (SAP)
   d. # of Red Flag Warnings issued for synoptic-scale criteria that did not verify (SWN)
   e. # of synoptic-scale Red Flag events that occurred-but for which a Red Flag Warning was not issued (SEN)
   f. The sum of the Lead Times for all synoptic-scale events (SLS)
   g. The average Red Flag Warning lead time for synoptic-scale events (if the Lead Time is less than 5 minutes, input a Lead Time of zero. Also, input Lead Time of zero for any event that occurred without a warning) (SLA) SLA = SLS / (SWV + SWN)

POD(S):
FAR(S):
CSI(S):

3. **Total Red Flag Warning** verification (Dry thunderstorm and synoptic-scale)
   a. # of Red Flag Warnings issued (TWI) (TWI = DWI + SWI)
   b. # of Red Flag warnings that verified (TWV) (TWV = DWV + SWV)
   c. # of verified Red Flag warnings preceded by a Fire Weather Watch (TAP) (TAP = DAP + SAP)
   d. # of Red Flag Warnings that did not verify (TWN) (TWN = DWN + SWN)
   e. # of Red Flag events that occurred - but for which a RFW was not issued (TEN) (TEN = DEN + SEN),
   f. Sum of the lead times for both dry thunderstorm and synoptic-scale events (TLS)
   g. Average lead time for Red Flag Warnings issued for both types of events (TLA) (TLA = TLS / (TWN + TEN)

POD(T):
FAR(T):
CSI(T):

4. **Fire Weather Watch** forecasts/events
   a. # of Fire Weather Watches issued (ATI),
   b. # of Fire Weather Watches issued and followed by a verified Red Flag event (ATV),
   c. # of Fire Weather Watches issued but not followed by a verified Red Flag event (ATN),
   d. # of Red Flag events that were not preceded by a Fire Weather Watch (ANI),
   e. Percentage of total # of verified Red Flag Warnings that were preceded by Fire Weather Watches (A%W), (A%W = TAP / TWV)

IV. JOINT RESPONSIBILITIES

Service boundaries and fire weather forecast zones may be negotiated to meet customer and forecaster need.

V. BACKUP PROCEDURES

A. Backing up the Marquette forecast office (for APX and GRB staff)

We exchange primary backup responsibility with WFO Gaylord and secondary responsibility with WFO Green Bay. Please see the Service Area and Organizational Directory for phone numbers.

Forecaster Note:
Please view our intranet site, http://xxx or http://xxx
and go to select Staff Bookmarks (from the top bar) > Fire Weather > MQT Fire Intranet Page
For additional information, please contact MQT Fire Weather Focal Point (s) or other staff members.

Backup Quick Reference

- Grids created through GFE, Procedures, Create Fire_Wx_Grids
- Products issued through the GFE Formatter Launcher
  - FWF (Our FWF)…issued by 6 am EST daily (traditionally from April 15th – November 1st)
  - FWM (Our FWM)...all NDFD sites requested through NMCFWOER (usually top 5)
  - Spot (Our Spot Forecast)
  - RFD (RFD)…at the request of the agencies (play on NWR every ~10 min.)
  - RFW (Hazard_RFW)…coordinate with MIWFPA users (play on NWR every ~10 min.)
    - Michigan DNR – Duty Officer
    - Hiawatha NF, Pictured Rocks NL – Steve Nurse/Matt Davis
    - Seney NWR – Gary Lindsay
    - Ottawa NF – Duty Officer
    - BIA – Will Wiggins

    Criteria:
    - A dry spell for over a week (shorter before spring green-up or after fall color)
    - Sustained Wind Speed > = 20 mph (10 m ASOS-Airport winds)
    - or >= 15 mph (20 ft RAWS winds)
    - Relative Humidity 25% or less
    - Temperature 70 F or greater

      Note: Temperature criteria is a soft criteria. Red Flag Warnings can be used for temperatures less than 70 degrees depending on other factors.
  - Friday 10 am EST MIWFPA Conference Call…spring and late summer only
    - xxx-xxx-xxxx (participant code xxxxxxx)
    - Weather for the week, potential for RFWs

B. Backing up surrounding offices (for MQT staff)

Forecaster Note:
See the attached reference material from both APX and GRB (in the Fire Weather Binder and MQT Fire Intranet site).

Please remember to set up the appropriate AWIPS workstation alarms for spot requests.

- Gaylord: ARBSTQAPX
- Green Bay: MKESTQGRB

VI. SIGNING PAGE AND EFFECTIVE DATES OF THIS AOP

This Agreement shall be effective until the issuance of the next Annual Operating Plan, expected out March of next year.

National Weather Service, Marquette, MI, NOAA

_____ _____

Jason Alumbaugh –Co-Fire Weather Focal Point *Date*
Kari Fleegel – Co-Fire Weather Focal Point/IMET
Robin J. Turner – Meteorologist in Charge

Hiawatha National Forest, USFS

_____ _____

Steve Nurse – Fire Management Officer *Date*
Jim Flores – UPC Coordinator
Linda Peterson - Dispatcher

Isle Royale National Park, NPS

_____ _____

Marshall Plumer- Acting Chief Ranger *Date*

Michigan Department of Natural Resources

_____ _____

Allan Keto – Resource Protection *Date*
Robert Ziel – Fire Management/FBAN
Celeste Chingwa – Fire Management

Pictured Rocks National Lakeshore, NPS

_____ _____

Matthew Davis *Date*
Bruce Leutusher – Vegetation/Fuels
Tim Coyler – Chief Ranger
Steve Nurse – Fire Management Officer, UP Coordination Center

Ottawa National Forest, USFS

_____ _____

Dean Karlovich – Fire Management Officer *Date*
Bob Garrison – Assistant Fire Management Officer
Susan Spear – Forest Supervisor

Seney National Wildlife Refuge, USFW

_____ _____

Gary Lindsay – Fire Management Officer *Date*
Michael Tuffelmire – Refuge Senior Firefighter
Greg McClellan – Deputy Refuge Manager
Mark Vaniman – Refuge Manager
Steve Nurse – Fire Management Officer, UP Coordination Center

US Bureau of Indian Affairs (BIA)

_____ _____

Will Wiggins – Fire Management Fuels Specialist *Date*

VII. ATTACHMENT #1 (NATIONAL AGREEMENT)

A. Inter-Agency Agreement for Meteorological Services – November 7, 2002

Department of Commerce • National Oceanic & Atmospheric Administration • National Weather Service

NATIONAL WEATHER SERVICE INSTRUCTION 10-406
NOVEMBER 7, 2002
Operations and Services
Fire Weather Services, NWSPD 10-4
Interagency Agreement for Meteorological Services Among the Bureau of Land Management, Bureau of Indian Affairs, U.S. Fish and Wildlife Service, and National Park Service of the U.S. Dept. of Interior; the Forest Service of the U.S. Dept. of Agriculture; and the National Weather Service of the U.S. Dept. of Commerce

NOTICE: This publication is available at: http://www.nws.noaa.gov/directives/.
OPR: OS22 (D. Billingsley) **Certified by:** OS22 (J. Lee)
Type of Issuance: Intial.
SUMMARY OF REVISIONS: Together with NWSPD 10-4, this directive supersedes WSOM Chapter D-06, "Fire Weather Services Program", Issuance 91-11, dated August 22, 1991; OML 03-95, dated April 27, 1993; and OML 04-99, dated September 9, 1999.
signed 11/07/02
Gregory A. Mandt Date
Director, Office of Climate, Water, and Weather Services

INTERAGENCY AGREEMENT
for

METEOROLOGICAL SERVICES

Among the
Bureau of Land Management
Bureau of Indian Affairs
U.S. Fish and Wildlife Service
National Park Service
of the
United States Department of the Interior
and the
Forest Service
of the
United States Department of Agriculture

and the

National Weather Service
of the
United States Department of Commerce

BLM Agreement No. 1422RAI02-0030
BIA Agreement No.
FWS Agreement No.
FS Agreement No. 02-IA11130206041
NPS Agreement No.
NWS Agreement No. 201-02-002

1.0 INTRODUCTION.

Fire management and suppression in the nation's wildlands is an on-going concern to the American public and to the Department of the Interior's Bureau of Land Management, Bureau of Indian Affairs, Fish and Wildlife Service, and National Park Service, and the Department of Agriculture, Forest Service, as well as to the Department of Commerce, National Oceanic and Atmospheric Administration-National Weather Service (NWS). Considerable cooperation and coordination among these agencies exists, which is critical to the success of fire management,

suppression and safety. This agreement will refer to the National Weather Service as "NWS" and the federal wildland fire management agencies as the "Interagency Wildland Fire Agencies."

The National Weather Service is legally mandated to issue weather forecasts and warnings for the protection of life and property. The Interagency Wildland Fire Agencies are responsible for the stewardship and/or protection of lands owned or held in trust by the United States or under the jurisdiction of state agencies.
The NWS and Interagency Wildland Fire Agency responsibilities are defined in Section 5. The NWS Weather Forecast Office (WFO) products and services shall be focused on respective County Warning Forecast Areas (CWFA) for the operational concerns of local wildland fire agency districts, while Interagency Wildland Fire Agencies shall focus on geographic area and national level products and services. The needs of geographic areas are met using a geographic area Memorandum of Understanding and/or geographic specific Annual Operating Plan (AOP) - (see appendix 1 for a suggested outline), and this Interagency Agreement. The NWS and Interagency Wildland Fire Agencies will coordinate and cooperate on developing fire weather policy, standards and guidelines

2.0 AUTHORITIES.

Economy Act of June 30, 1932 (47 Stat. 417; 31 U.S.C. 1535), as amended.

Travel Authority (5 U.S.C. 5702).

Organic Act of 1890 (15 U.S.C. 313).

Joint Project Authority (49 U.S.C. 44720).

E. Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.).

F. National Park Service Organic Act of August 1916 (16 U.S.C. 1).

National Wildlife Refuge Administration Act of June 27, 1998 (16 U.S.C. 668dd)

H. Disaster Relief Act of 1974 (42 U.S.C. 5147).

I. National Indian Forest Resources Management Act of 1990 (25 U.S.C. 3101 et seq.).

Cooperative Forestry Assistance Act of 1978 (P.L. 95-313, 92 Stat. 365 as amended; 16 U.S.C. 2101 (note), 2101-2103, 2103a, 2103b, 2104-2105).

K. Federal Fire Prevention and Control Act of October 29, 1974, (P.L. 93-498, 15 U.S.C. 2201 et seq., 88 Stat 1535.)

3.0 PURPOSE.

The purpose of this Inter-Agency Agreement is to combine resources and provide complementary services without duplication to best serve the needs of the public and all agencies for the protection of life, property and resource values to enhance ecosystem health. Accurate and timely meteorological and fire danger information is required to

manage these resources effectively and efficiently. It is also the purpose of this Agreement to set forth the terms and conditions under which the NWS will continue to provide meteorological services to support these efforts as requested by the Interagency Wildland Fire Agencies. It is with this knowledge that this Inter-Agency Agreement is entered into.

This Agreement supersedes the National Agreement for Meteorological Services in Support of Agencies with Land Management and Fire Protection Responsibilities" among the six participating agencies, as listed above, that was effective June 1983.

4.0 OBJECTIVES.

The objectives of this Agreement are:

A. To identify meteorological services to be provided;

B. Establish interagency relationships; and

C. Define obligations of the NWS and Interagency Wildland Fire Agencies.

5.0 RESPONSIBILITIES.

The responsibilities listed are not all-inclusive, but are meant to provide the overall scope of services provided by the respective agencies.

A. The National Weather Service agrees to:

All obligations undertaken by the NWS under this Agreement are subject to the availability of appropriated funds.

1. Provide Basic Meteorological Services: Basic Meteorological Services will be provided in accordance with the Annual Operating Plan (AOP) for Fire Weather Service for designated NWS offices. These services will be made available without cost to Interagency Wildland Fire Agencies and will include:

    a. Routine fire weather forecast and updates during the designated period outlined in the AOP.
    b. Extended and long-range weather and climate outlooks.
    c. NWS weather observations.
    d. Fire Weather Watch and Red Flag Warning program.
    e. Site-specific forecasts for wildland fires or special federal projects (i.e. spraying, seeding, fuels management, or search and rescue operations).
    f. Provide consultation and technical advice in support of basic services to Interagency Wildland Fire Agencies.
    g. Provide weather information to a central communication gateway and the internet for Interagency Wildland Fire Agencies' use and further distribution.

h. Provide a cadre of Incident Meteorologists (IMET) in support of the fire weather program.
i. Maintain a current list of offices providing basic meteorological services.
j. National scale short-range fire weather outlooks.

2. Non-Routine Services: These services will be provided by designated NWS offices.

Expenses above planned salary and operating costs will be borne by the benefiting agency.

a. Weather Observer training.
b. Weather observation station visits.
c. Participation in Wildland Fire Agency training.
    1. Course development.
    2. Classroom instruction.
d. On-site meteorological services.
e. Other special fire management services.

3. Fire Weather Training: The NWS recognizes the need for specialized training in fire weather meteorology for forecasters. Costs associated with training NWS staff will be borne by NWS. The NWS will meet this need as follows:

a. The NWS will ensure all meteorologists producing fire weather products have met the minimum fire weather forecaster training requirements.
b. The NWS will provide specialized training for the purpose of qualifying NWS IMETs.

4. Participation in interagency groups: All NWS costs will be borne by NWS.

5. Wildland fire suppression related activities: The NWS will not charge an administrative surcharge or any other expenditure that is not authorized under the Wildland Fire Agencies' Appropriation Acts related to these activities.

B. Interagency Wildland Fire Agencies

Wildland Fire Agencies' programs provide Geographic Area and national products for the strategic role of resource prioritization and utilization. Specific responsibilities of Wildland Fire Agencies are listed below.

1. Operational Support and Predictive Services

a. Geographic Area and national level fire weather products, services and assessments will be provided for resource allocation and prioritization.
b. Integration of weather and climatic sciences into Geographic Area

Coordination Center (GACC) operations.

c. Develop value-added products to enhance short and long-range outlooks and projections.
d. Provide weather briefings to GACC and NIFC Coordinators and Multi-agency Coordinating Groups.
e. Manage weather and climatology portions of GACC web site.
f. Manage agency fire weather infrastructure.
g. Smoke management.

2. Program Management

Program management of federal land management and fire agencies' fire weather responsibilities, which includes:

a. Program coordination with state agencies.
b. Programmatic guidance, evaluation and certification.
c. Advice and staff support to Fire Directorate
d. Manage weather station network.
e. Liaison between field users and service providers.
f. Participation in activity reviews.

3. Monitoring, Feedback and Improvement

a. Transmit feedback to product and service providers.
b. Suggest improvements to providers of products and services received.
c. Advise agencies on quality control of weather observations.
d. Coordination with NWS and users in assessment and evaluation of program effectiveness.
e. Fire weather expertise in accident/incident investigations.

4. Technology Transfer

a. Transfer meteorology and climatology knowledge to field level personnel.
b. Promote proper usage by agency personnel of weather and climate products and services.
c. Conduct training/expertise needs assessment.
d. Coordinate data and technology acquisition.
e. Participation on training cadre.

5. Agency Computer Systems

Where fire management computer systems are locally available, access to the systems will be granted to NWS to provide services, as needed. Costs will be borne by the Interagency Wildland Fire Agencies for requirements that are beyond the distribution of weather information through a central communications gateway.

6. Fire Weather Observations:

   a. Provide routine surface weather observations to NWS.
   b. Provide all equipment, equipment maintenance, inspection of weather observation sites, and data quality control.
   c. Pay all travel and per diem costs associated with Interagency Wildland Fire Agencies' requests for visits of NWS personnel to weather observing sites.
   d. Provide for collection, storage and retrieval of remote automatic weather stations (RAWS) data.
   e. Provide observations for site specific and other special forecasts.

7. On-Site Meteorological Support:

   a. Pay costs directly associated with on-site meteorological support by NWS personnel. This includes costs incurred by the NWS IMET duty station.
   b. Provide logistical and weather observation support to NWS personnel at on-site operations.
   c. Provide and pay costs associated with telecommunication services.

8. Training:

   a. Pay per diem and travel costs for NWS personnel instructing and providing course development in Wildland Fire Agency training.
   b. Provide technical assistance, instruction, and supporting material for NWS sponsored fire weather training sessions.

9. Other Non-Routine Services

   Interagency Wildland Fire Agencies will provide logistics support and pay all overtime, travel, and per diem costs of NWS personnel associated with the provision of all other special fire meteorological services, including Wildland Fire agency approved wildland fire familiarization for NWS personnel.

6.0 JOINT RESPONSIBILITIES:

NWS and Interagency Wildland Fire Agencies shall jointly prepare national and Geographic Area specific MOUs and/or AOPs for Fire Weather Services that will set policy and procedures at GACC, NIFC, state or forecast office level, and shall include:

A. Shared responsibilities of all participants shall include, but not limited to weather briefings, training, research, product/service verification as outlined in Geographic Area specific AOPs.

B. Provision for monitoring, feedback and improvement.

C. Procedure for documenting, monitoring and evaluating fire weather products,

briefings and services delivered.

D. Provision for monitoring and evaluating advances in science and technology.

E. Provision for efficient means for technology transfer.

F. Provision for participation in fire weather research activities.

G. Provision that on-site IMET services may be provided by Interagency Fire Weather Meteorologist meeting NWS standards only when NWS IMETs are not available to meet Wildland Fire Agency resource requests on a national basis. The coordination for Interagency Fire Weather Meteorologists will be done between the NWS IMET coordinator and the National Interagency Coordination Center.

H. Provision that NWS meteorologists and Interagency Wildland Fire Agency meteorologists stationed at GACCs and at NIFC will work together to ensure fire agency decision makers receive consistent and coordinated fire weather products and services.

I. Provision that the NWS and Interagency Wildland Fire Agencies will jointly develop and share technology including meteorological software and data, Advance Technology Meteorological Units, portable weather stations, etc. to improve abilities and performance.

J. The NWS and Wildland Fire Agency meteorologists shall work closely in all phases of the fire weather forecast and warning program to resolve concerns and avoid potential inconsistencies in products and services prior to delivery to fire agency customers. The goal of all agencies is to maximize firefighter and public safety through a coordinated delivery of consistent services.

The Parties recognize that, given the current administrative process for payments for fire suppression activities, it is not feasible to obligate the full amount of funds that may be required by this Agreement, because the Agreement does not constitute a binding obligation under 31 U.S.C. § 1501 since it cannot anticipate the specific goods or services for which payment will be requested, or the individual payment amounts, in each future case. This information can only be provided by Resource Orders executed when the goods or services are requested. At the same time, the Parties recognize that Resource Orders are insufficient to constitute a binding obligation under the statute because there is no evidence of intent to be bound, no authorized signatures are present, and no legal authorities are cited. However, these requirements are satisfied by the Agreement. The two documents, when taken together, contain all the elements required for an obligation under the statute. Hence, the Parties agree that this Agreement shall automatically be incorporated by reference into any Resource Orders issued under it, and that an obligation of funds will occur at the time the NWS presents a copy of this Agreement and the Resource Orders for payment. The parties also agree to work toward a more efficient resolution of this administrative process for obligation and payment of fire suppression funds.

7.0 STATEMENT OF WORK.

Procedures for notification of and obtaining services from the NWS will be prepared and specified in the Annual Operating Plans (AOP) and/or in the MOUs for the Geographic Area Coordinating Centers, and in the Geographical Area and National Mobilization Guides. An electronic copy of the *National Mobilization Guide* can be viewed via www.nifc.gov - select "National Interagency Coordination Center" – select "References" link to National Mobilization Guide.

8.0 TRANSFER OF FUNDS.

A. Billing and collection procedures will follow the Intra-governmental Payment and Collection (IPAC) system process.

B. Wildland Fire Suppression Activities: Transfers under this subsection are under the Disaster Relief Act, 42 U.S.C. § 5147. Reimbursable costs are estimated not to exceed a maximum of $2,000,000.00 per fiscal year. In the event this amount is insufficient for a particular fiscal year, this Agreement may be modified to increase the amount of funding, subject to the availability of funds. This Agreement is automatically incorporated by reference into any Resource Order that is issued under it, constituting a binding obligation. The Interagency Wildland Fire Agencies warrant that they will administratively reserve these funds to ensure that the funds will be available when the obligations are recorded. The recording of the obligations will occur upon the receipt of the billings from the NWS by the applicable Interagency Wildland Fire Agency. The billings, inclusive of copies of this Agreement, the Resource Order(s), and expenditure documentation, will define the specific services, supplied goods and costs for each order, and subsequent obligation and payment.

1. Reimbursement payments for suppression-related activities will be accomplished by submission of billings, which are inclusive of copies of the Resource Orders that define the requested services and goods, and the expenditure back-up documentation. The NWS will not charge an administrative surcharge or any other expenditure that is not authorized under the Wildland Fire Agencies' Appropriation Acts related to these activities

2. It is the responsibility of the requesting agency/office to provide billing instructions to the NWS office that provided the service, which includes the items listed below. It is also the responsibility of the requesting agency/office to conduct any required verification of costs, authorization of expenditures and reconciliation of payment.
   a) The fire name, jurisdictional unit, and incident number (The copy of the Resource Order generally includes this information);
   b) Applicable support documentation requirements;
   c) A copy of this Agreement complete with signatures;
   d) Identification (name and phone number) of NWS financial contact;
   e) Provide information to NWS regarding which payment center to

send the billings for processing; and

f) Billings and support documentation are to be submitted to the appropriate payment center by the NWS within sixty-days of completion of service.

C. Non-Wildland Fire Suppression Activities: Obligation of funds and payments for non-wildland fire suppression activities that are included in the Annual Operating Plan (AOP) shall be accomplished by Task Orders against this Agreement between the concerned agencies by the responsible officers at the appropriate level operating within their authority.

1. All funding obligations must be placed against the individual agency/office's Task Order number and not against this Agreement number.

2. Task Orders to this Agreement may be approved and signed for the NWS by the Director, Office of Climate, Water and Weather Services.

3. Each federal agency shall make direct settlement from its own funds for all liabilities it incurs under this Agreement.

4. The NWS will not charge any agency that is signatory to this Agreement an indirect administrative surcharges for activities addressed in the respective Annual Operating Plan(s) and Geographical Area MOUs, and are requested through Task Orders or Resource Orders under the *National Mobilization Guide*.

5. Task Orders may be prepared in any format acceptable to the agencies involved in each project. At a minimum, each Task Order written in support of this Agreement will include the following items:

a) Detailed description of services to be done or supplies to be delivered;

b) Description of the deliverables;

c) Performance period for completion;

d) Cost estimates;

e) Identify responsible project officials for each Task Order agency;

f) Payment procedures (applicable billing procedures, identification of codes, method of payment—advance/reimbursement; and

g) Signature(s) by authorized personnel for each Task Order agency.

9.0 TERM OF AGREEMENT.

The terms of this Inter-agency Agreement shall become effective with and upon execution by NWS and any or all Interagency Wildland Fire Agencies and shall remain in effect for a period of five-years from the date the last signature was placed on the signatory section, or until such time as the Inter-agency Agreement is terminated by mutual agreement. Any signatory may terminate their participation in this Agreement by written notice to all other signatories provided that such notice shall be given between the dates of October 1 of any year and February 1 of the following year. Full credit shall be allowed for each party's expense and all non-cancelable obligations properly incurred up to the effective date of termination. The remaining signatories may continue the provisions of this Agreement as long as the NWS remains a signatory.

10.0 RESOLUTION OF DISAGREEMENT.

Should disagreement arise on the interpretation of the provisions of this Agreement, or modifications thereto, that cannot be resolved at the operating level, the area(s) of disagreement shall be stated in writing by each party and presented to the other party for consideration. If agreement on interpretation is not reached within thirty-days, the parties shall forward the written presentation of the disagreement to respective higher officials for appropriate resolution. Conflicts and/or disagreements that cannot be resolved at the regional (GACC) level will be elevated to the National Fire Weather Program Managers for the NWS and Interagency Wildland Fire Agencies. If the conflict cannot be resolved at the National Program Managers level, the conflict will be elevated to the Agency Director level (NWS and applicable Wildland Fire Agency Director) for final resolution.

11.0 GENERAL PROVISIONS.

A. Parties to this Agreement are not obligated to make expenditures of funds or provide services under terms of this Agreement unless such funds are appropriated or services are authorized by either the State Legislatures or the Congress of the United States, or are otherwise available under Section 101 and 102 of the Annual Appropriations Act for Interior and Related Agencies.

B. The points of contact listed in Section 13 will review this Agreement annually.

C. Modifications to this Agreement may be initiated by any signatory agency. The modifications shall not take effect until documented and signed by all signatory agencies.

1. The BLM is designated as the agency responsible for all administrative oversight of modifications to this agreement.

2. Modifications to this Agreement may be approved for the NWS and signed by the Director, Office of Climate, Water and Weather Services, or pursuant to NWS protocol.

D. The signatory Interagency Wildland Fire Agencies agree to consider expansion of this Agreement to cover areas of mutual concern, e.g., changing technology and

improved procedures, as opportunities for such cooperation become available.

12.0 WAIVER.

Each party to this agreement does hereby expressly waive all claims against the other party for compensation for any loss, damage, personal injury or death occurring in consequence of the performance of this agreement.

13.0 PRINCIPAL CONTACTS.

The Points of Contact are responsible for coordinating an annual review of the currency and adequacy of this Agreement among the signatories, and/or their designees.

National Weather Service:

National Fire Weather Program Manager
Rusty Billingsley
National Weather Service
3833 South Development Ave.
Boise, ID 83705
208/334-9824 – Office
david.billingsley@noaa.gov

Interagency Wildland Fire Agencies:

NIFC Fire Weather Program Manager
Rick Ochoa
National Interagency Fire Center
3833 South Development Ave.
Boise, ID 83705
208/387-5451-Office
rick_ochoa@nifc.blm.gov

14.0 DEFINITIONS.

When the following terms are used in this Agreement, or in an AOP, such terms will have the meanings stated below.

A. **Annual Operation Plan for Fire Weather Services (AOP):** A procedural guide, based on the National Interagency MOU and applicable Geographic Area MOUs, which describes fire meteorological services provided within the Geographic Area of responsibility, including NIFC. At a minimum the AOP will include the items in Appendix 1, *Annual Operating Plan - Required Elements and Suggested Format*.

B. **Assessment:** Fire weather and/or fire danger product based on a thorough evaluation of all pertinent sources of meteorological and fire danger information.

C. **Basic Meteorological Services:** Basic meteorological services are those state-of-the-science meteorological forecasts, warnings, observations and statements produced at a designated NWS office.

D. **Fire Weather Watch:** Fire Weather Watch is issued to advise of conditions, which could result in extensive wildfire occurrence or extreme fire behavior, which are expected to develop in the next 12 to 48 hours, but not more than 72 hours. In cases of dry lightning, a Fire Weather Watch may be issued for the next 12 hours. Fire Weather Watch meteorological and fuel criteria will be defined in the AOP.

E. **Geographic Area:** A geographic boundary designated by Interagency Wildland Fire Agencies, where these agencies work together in the coordination and effective utilization of resources within their boundaries. The *National Interagency Mobilization Guide* identifies the areas encompassed by the eleven Geographic Areas.

F. **Geographic Area Memorandum of Understanding (MOU):** A document, based on the National Interagency Memorandum of Understanding for Meteorological Services, which establishes local policy to meet unique needs of a Geographic Area.

G. **Incident Meteorologist (IMET):** A meteorologist specially trained to provide on-site meteorological support of Wildland Fire Agency designated incidents.

H. **Non-Routine Services:** Meteorological services uniquely required by interagency Wildland Fire Agencies, which usually are not provided from a designated NWS office.

I. **On-Site Meteorological Services:** Special service which dedicates an IMET to an incident so that they are removed from their normal duties.

J. **Predictive Services:** Those Geographic Area/national level fire weather and/or fire danger services and products produced by Wildland Fire Agency meteorologists in support of resource allocation and prioritization.

K. **Red Flag Warning:** Red Flag Warning is used to warn of impending or actually occurring critical weather conditions that could result in extensive wildland fire activity. A warning will be issued when the forecast time of onset is less than 24 hours. Red Flag Warning meteorological and fuel criteria will be defined in the AOP.

L. **Routine Fire Weather Forecasts:** A Routine Fire Weather Forecast is a scheduled narrative and/or matrix forecast of weather parameters pertinent fire management activities in support of protection of life, property, and resources at risk in a given area. The number of parameters may vary due to regional weather requirements, but normally include a brief weather synopsis, expected weather and clouds, duration of precipitation, maximum and minimum temperature/relative humidity, wind direction and speed, transport and stability parameters, and lightning activity level. These forecasts normally cover the next 48 hours and may include input for the computation of National Fire Danger Rating System indices. These forecasts may also include long-range outlooks.

M. **Site Specific Forecasts:** Site-specific forecasts are issued when requested by Interagency Wildland Fire Agencies for wildland fires. These forecasts differ from routine fire weather forecasts by incorporating greater detail in timing, higher resolution of terrain influences, and incorporate meso-scale and sometimes micro-scale weather influences impacting the site. These may be generated from an office with Wildland Fire supplied information (i.e., location, weather observations, objectives) or generated by an IMET assigned to the incident. Forecast formats

may vary but all are highly tailored to satisfy requirements of the incident objectives.

N. **Wildland Fires:** All ignitions that occur on wildlands.

15.0 SIGNATORY.

This Agreement shall be effective on the date the last signature is placed on the signature section and it will remain in effect for a period of five-years from the date of the last signature.

_____ _____

Gregory A. Mandt, Director Date
Office of Climate, Water and Weather Services

_____ _____

Byron J. Green, Contracting Officer Date
Bureau of Indian Affairs

_____ _____

Dan Ashe, Chief, National Wildlife Refuge System Date
Fish and Wildlife Service

_____ _____

Donna Kalvels, Chief, Contract Office Date
National Park Service

_____ _____

Larry Hamilton, Director Date
Bureau of Land Management-Office of Fire & Aviation

_____ _____

Richard A. Harter, Supervisory Contract Officer Date
Bureau of Land Management-Office of Fire & Aviation

_____ _____

Phil Street, Director Date
DOI-Fish and Wildlife Service

_____ _____

Jim Stires, Fire Director Date
DOI-Bureau of Indian Affairs

_____ _____

Sue Vap, National Fire Management Officer Date
DOI-National Park Service

_____ _____

Alice Forbes, Acting Director Date
USDA, Forest Service-NIFC

_____ _____

Tory Majors, Administrative Officer Date
USDA, Forest Service-NIFC

Appendix 1
Annual Operating Plan
Required Elements and Suggested Format

I. INTRODUCTION

The introduction will include a general statement of purpose and an explanation of the relationship between the Annual Operating Plan (AOP) and the Geographic Area Coordinating Center Memorandum of Understanding (MOU) for Meteorological Services, and the Geographic Area Mobilization Guide and/or the National Mobilization Guide will be referenced.

II. SERVICE AREA AND ORGANIZATIONAL DIRECTORY

A. List of weather offices and points of contact
B. List of agencies participating

III. SERVICES PROVIDED BY THE NATIONAL WEATHER SERVICE

A. Basic Services
   1. Routine fire weather forecasts
      a. Issuance (seasonal, daily)
      b. How forecast is issued and accessed
      c. Content of the forecast
   2. Site-specific wildland fire forecasts
      a. Criteria
      b. Contents
      c. Procedures
   3. Fire Weather Watch, Red Flag Programs
      a. Criteria
      b. Contents
      c. Procedures
   4. Participation in interagency groups.

B. Special Services. Procedures for obtaining and billing for special services.

C. Training. Procedures for obtaining and billing for special services.

IV. WILDLAND FIRE AGENCY RESPONSIBILITIES

A. Operational support and predictive services.
   1. Program management
   2. Monitoring, feedback and improvement
   3. Technology transfer
   4. Agency computer systems
   5. Fire weather observations
   6. On-site support
   7. Training

V. JOINT RESPONSIBILITIES

Negotiate service boundaries and fire weather forecast zones to meet customer and

forecaster need.

VI. EFFECTIVE DATES ON THE AOP

VII. SIGNATURE PAGE

VIII. APPENDICES

A. Interagency Agreement for Meteorological Services in Support of Agencies with Land and Fire Management Responsibilities
B. Fire weather zone maps.
C. Catalog of fire weather observation sites.